

suitability for building development. The method, it is claimed, has relevance for locational decision-making and the design of sub-regional plans.

Dr. STREMLAT's work is well-presented, with attractive cartography, and there is no doubt that detailed maps of potential development land are useful to the planner. There are, however, several question marks to be raised against the particular arguments presented in this work. Firstly, the concept of land potential maps, although presented here as if new, has a longish pedigree; 'sieving' techniques can be found written up in standard British planning texts from the 1940s onwards. Secondly, the high degree of detail in which the author's maps are prepared, even accepting the possibility of operationalising the methodology for computer systems, seems at the same time superfluous to the realities of subregional planning practice and doomed to permanent obsolescence in terms of information content. Where broad-area planning is involved, decisions rest more on political considerations and wider policy issues than on the precise composition of land use. Where individual locational decisions are called for, it is likely that detailed local investigations and public participation exercises will in any case be necessary. This being so, it seems unlikely that the resources needed to compile and update development potential maps of the kind presented here would be considered justified by planning authorities.

Norman PERRY, London

BARTELS, G. (1970): *Geomorphologische Höhenstufen der Sierra Nevada de Santa Marta (Kolumbien)*. Gießener Geographische Schriften, Heft 21. 56 S., 6 Karten, 3 Fig., 35 Photos. Gießen: Geographisches Institut d. Justus Liebig-Universität.

This geomorphological treatise is part of the Research project guided by Prof. H. Uhlig (Giessen) the aim of which is to find out the geographical character of a high mountainous area in the tropics.

This geographical character ("Individualität") among others comprises the geomorphological processes of the present and the past as well as the forms that are the results of these processes. This means that a study of the geographical character of a tropical mountain range will yield information and data that might be very useful to that field of geomorphology that sometimes is called "tropical geomorphology", a field that has not yet been fully explored. The work of BARTELS is very interesting indeed in this respect; in the first place because the author gives a (short, but clear) picture of the difference between the processes that act in the general zones between sea level and 5684 m, both on the humid and the semi arid sides of the mountain range; and moreover because he had the opportunity to postulate climatic changes that must have taken place during the Quaternary.

As to the difference in the processes in the altitudinal zones the author states that in the foot-hills (elevation 0–400–600 m) under rain forest the denudation is appreciably less and weathering of the quartz diorite on the other hand is more important than under semi arid condition. Between 400 and 300 m the rocks, especially the plutonic rocks, are deeply weathered. If the original vegetation is still present the influence of erosion is only very weak. But in the regions where the forest has been cleared a tremendous soil erosion has taken away a very important part of the soil. Between 3000 and 4300 m, in the paramo-region, mechanical as well as chemical weathering is absent. Periglacial phenomena were found above 4300 m and only in the highest tracts some glaciers are present. Then glaciers, however, were much more important during the last glacial period.

Between 3000 and 3500 m a landscape with very fine glacial forms was mapped. And also in the lower zones traces of climatic changes were found: periglacial forms in about 2200 m, terraces composed of boulders and gravel, and initial pediplains in the still lower zones.

Some characteristic parts of the Sierra Nevada de Santa Marta have been represented in geomorphological maps in the scale 1:4,000; two maps in a much smaller scale (1:100,000) give impressions concerning the frequency of slopes of different classes and the general geomorphological situations in the mountain range. Undoubtedly the author has contributed much to the present knowledge of the geomorphology of tropical mountains.

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FREJKA, T. (1973): *The Future of Population Growth. Alternative Paths to Equilibrium*. 268 pp., tables and diagrams. New York: John Wiley & Sons. £5.35.

Dr. FREJKA, a staff associate in the Demographic Division of the Population Council in New York, has written a concise, but thought-provoking book on a fundamental problem; that of the scale of world population growth now and in the future and the pathways along which fertility trends, in particular, must be guided if the predicted and alarming rates of growth are to be corrected. While the facts of the present situation are generally acknowledged, the implications of recent and current population trends are often imperfectly realized and specific guidelines for policy-makers are often imprecise or lacking. Students of this problem, and administrators and policy makers faced with it, will all be indebted to Dr. FREJKA for spelling out these clearly and soberly.

In seeking to answer questions as to whether population growth should cease and when, with what target population and with what demographic consequences this should occur, Dr. FREJKA has utilized basic techniques of population projection "... to identify the

demographic trends necessary to reach a non-growing stationary state". A series of "alternative paths" towards this end are set out in text tables and in two substantial appendices concerning the statistical methods used in the projection. There is also a series of tables of standard sets of projections for the world, and the more and less developed regions for five target dates for reaching Net Reproduction Rate of 1.0 (and eventual stability): 1970–75; 1980–85; 2000–05; 2020–25 and 2040–45.

The text outlines the demographic basis of the problem in largely non-technical language and presents a selection of the findings for the two worlds and their major regions and for selected countries (including a chapter specifically on the USA which also includes the implications for population structure of the various projections. These findings are a reminder that future population growth is determined to a considerable extent by past as well as present demographic events which are embodied in population structure and which make sudden alterations in the course of population trends difficult to achieve. Fertility assumptions are regarded as basic to the study, since it is assumed that generally falling mortality, especially in the developing world, will continue. The wide and diverging paths of the "optimistic" and "pessimistic" projections of progress to stationary growth underline the uncertainties of population projections which both Dr. FREJKA himself and, in a foreword, Bernard BERELSON of the Population Council underline. On the most optimistic—and quite unrealizable—assumption, that of net reproduction rate of 1.0 in 1970–75, a maximum population of some 5,691 millions would be reached only about the year 2,100, but on the least optimistic assumption (NRR 1.0 in 2040–45) the maximum about 2125 would be 15,154 millions; for the developed world, with its low and largely controlled fertility, the range would be 1,427m and 1,955 m, but, for the developing world there is a staggering area of uncertainty of 9,665 m between 4,251 m on the "optimistic" assumption and 13,917 m on the "pessimistic". The implications of slow birth decline are staggering in sheer numbers, let alone in terms of their social, economic and political implications.

The message of this important book is clear: policies leading to fertility control are a matter of immediate and world-wide urgency. Even allowing for the inaccuracy of much population data for the developing world and the notorious difficulties in making any other than short-term predictions of likely population growth, the projections given are a far more persuasive argument for population control now than any polemic. The book underlines the essentially fundamental fact of population which underlies many of the world's food, resource and environmental problems. The text is not always easy going to those without any demographic education, but the excellent diagrams and tables will assist those who rightly will wish to follow not only the general drift but the details of the argument.

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