Belgeo
Revue belge de géographie

2 | 2002
Physical geography beyond the 20st century

Editorial: Physical geography beyond the 20th century

Morgan De Dapper

Electronic version
URL: http://journals.openedition.org/belgeo/15980
DOI: 10.4000/belgeo.15980
ISSN: 2294-9135

Publisher:
National Committee of Geography of Belgium, Société Royale Belge de Géographie

Printed version
Date of publication: 30 June 2002
Number of pages: 71-76
ISSN: 1377-2368

Electronic reference
Morgan De Dapper, « Editorial: Physical geography beyond the 20th century », *Belgeo* [Online], 2 | 2002, Online since 01 July 2002, connection on 23 September 2020. URL : http://journals.openedition.org/belgeo/15980 ; DOI : https://doi.org/10.4000/belgeo.15980

Editorial: Physical geography beyond the 20th century

Morgan De Dapper

1 In his book "The Nature of Physical Geography", published in 1985, Ken Gregory wrote in the preface: "Physical geography is now poised for great development in view of the focus of recent works and research and the advent of new technology including the microcomputer, electronic instrumentation and enhanced remote sensing" (Gregory, 1985).

2 Indeed, during the last twenty years we saw a growing number of books and articles in which physical geographers direct their attention definitively to new subjects such as experimental geomorphology or the use of advanced techniques such as stable isotopes. Moreover, an increasing number of physical geographers were contributing in interdisciplinary endeavour, producing works to which scientists, covering different specialisms inside and outside the Earth sciences, contribute.

3 Simultaneously new technology, such as the microchip and the microcomputer, offered enormous strides in acquisition and analysis of data on the physical environment.

4 Remote sensing provides inputs to physical geography since the late 1960s. However, new generations of satellites offering greater resolution, using a wider extent of the electromagnetic spectrum and affording repeated coverage over time spans of a few weeks, allowed to largely complement and even replace the classic field surveys.

5 This new developments coincided with a time of greater environmental awareness. Andrew Goudie's standard work "The Human Impact on the Natural Environment", was first published in 1981 and saw the fifth edition in 2000 (Goudie, 2000). The Brundtland-report "Our Common Future" of the World Commission on Environment and Development was published in 1987 and culminated in the UNCED-"Earth Summit", held in Rio in 1992.

6 Many physical geographers responded to that appeal by applying the results of their research to prevent or alleviate Man-induced physical processes such as accelerated soil erosion, desertification or flooding. This change in attitude offers opportunities for

reconciling physical and human geography, despite the tendencies for increasing divergence between both disciplines; a centrifugal tendency which is promoted by the disparity in the theory requirements for human and physical geography.

7 Ever since its academic establishment around 1850, physical geography – the meeting place of geosphere, bio(including Man)sphere, hydrosphere and atmosphere – encompasses a wide range of subjects. In order to see the wood for the trees, Gregory (1978) proposed a "physical geography equation" – F = f(P, M) dt – which embraces morphological elements, or results of the physical environment (F), processes operating in the physical environment (P) and the materials (M) upon which the processes operate over periods of time t. He further suggests that studies by physical geographers can be envisaged as taking place at four levels of this equation:

1. study of the elements or components of the equation, i.e. the study of surface form, processes or materials in their own right. This is often a descriptive phase which can of course be quantitative, can embrace a considerable amount of innovation in the development of techniques, and is often preparatory to other levels.
2. study of the way in which the equation balances at different scales and in different subdivisions of physical geography. At this level the focus is upon equilibrium situations.
3. analysis of the way in which the equation varies over time and the way in which one equilibrium situation is disrupted and eventually replaced by another equilibrium. This stage can be thought of as differentiating the equation in mathematical terms. This type of study relies on reconciliation of data obtained from different time scales and on appreciation of some theory of adjustment of environments over time. At this stage of course, the significance of human activity has to be taken in consideration because this is often the regulator that has altered an environmental system and has created a control system.
4. application of the results of study of the equation depends very often upon extrapolation of past trends at spatial or temporal scales to locations for which estimates need to be made. This type of development can effectively only occur as a fourth stage. It was in the past often not developed because of a reticence on the part of physical geographers which prevented them taking their research to the logical conclusion of application of the results to contemporary and future environmental problems.

8 The papers presented in this volume testify to the wide scope of physical geography, show that research is done at all levels of the "physical geography equation" and confirm that the new trends of the last twenty years go beyond the 20th century.

9 The paper of Cecile Baeteman and Pierre-Yves Declercq presents a broad scheme of coastal evolution in the western part of the Belgian coastal plain throughout the Holocene. It is a fine example of a classical regional study based on sound field survey and an historical approach.

10 Diane Saint-Laurent, Michel Bérubé, Isabelle Thériault and Michel Lemieux examine the processes and phenomena which affect the banks of the lower portion of the Saint-Maurice River, one of the important rivers of Southern Québec which is largely regularised by Man by the construction of several hydroelectric power plants.

11 The paper of Roland Souchez, Réginald Lorrain and Jean-Louis Tison shows how the use of stable water isotopes can be extremely helpful for studying two of the most important environmental issues that will affect human development in the course of the 21st century, namely Man-induced climatic changes and water resources. The latter is clearly illustrated by a study of the origin of precipitation in the Mediterranean basin

in relation to recharge of an aquifer in south east Spain presented by Elisabeth Frot, Bas van Wesemael, Grégoire Vandenschrick, Roland Souchez and Albert Solé Benet.

12 Jeroen Nachtergaele, Jean Poesen and Gerard Govers bring a study on ephemeral gully erosion, a significant water erosion process which accounts for almost half of the total sediment production in agricultural catchments in the Belgian loess belt. This study offers an excellent example of the boom of experimental geomorphology.

13 More than 90% of the Ethiopian population is rural; it stands therefore for reason that understanding the physical processes which affect soil properties are extremely important. The paper of Jan Nyssen, Jan Moeyersons, Jean Poesen, Mitiku Haile and Jozef Deckers deals with the development of rock fragment covers by the process of argillipedoturbation on Vertisols in the Ethiopian Highlands. It offers a fine example of interdisciplinary research – involving classical and experimental geomorphology, pedology and agronomy – and of the application of physical geography in an attempt to understand and eventually prevent land degradation, one of the major threats of the African continent.

14 Africa is also the concern of Pierre Ozer. Since the late 1960s, West-Africa is affected by the most severe and prolonged drought of the 20th century. In addition intensified Man-made environmental degradation processes are progressively leading to a widespread desertification of this region. In his paper Ozer presents and discusses the evolution of dust generating phenomena and the variability of deflation events since 1951. Deflation events frequency is proposed as a climatic indicator to assess the trend of land degradation in the Sahel.

BIBLIOGRAPHY

GOUDIE A. (2000), *The Human Impact on the Natural Environment*, Oxford, Blackwell Publishers.

GREGORY K. (1978), "A physical geography equation", *National Geographer, 12*, pp. 137-141.

GREGORY K. (1985), *The Nature of Physical Geography*, London, Edward Arnold.

AUTHOR

MORGAN DE DAPPER

Professor in Physical Geography, President of the Belgian Association of Geomorphologists, Department of Geography, University of Ghent