Introduction

The beginning of ICTP College on Soil Physics - In 1980, Donald M. Gabriels, a soil physicist of Ghent University, Belgium and Edward L. Skidmore, a research leader at the USDA-ARS Wind Erosion Unit, Manhattan, Kansas, USA gave lectures at the ICTP Autumn Course on the Physics of Flow in the Oceans, Atmosphere and Deserts. Although they never met before, each knew about the work the other was doing.

At one of the lunches during the autumn course with the late Professor Abdus Salam, Nobel laureate in Physics and founder and director of ICTP, Trieste, Italy, Gabriels was asked about his main activities. Salam thought that Gabriels had said that his major field of interest was 'solar' – not 'soil' physics. In fact the two words 'solar' and 'soil' have something in common; just refer to 'el sol' (Spanish for 'sun') and 'le sol' (French for 'soil').

During the excursion in 'desertic' regions after the autumn course on the Physics of Flow in the Oceans, Atmosphere and Deserts, Skidmore was also asked his opinion about a soil physics course to be organised at ICTP. The encounter with some misunderstandings of terminology between Gabriels and Abdus Salam, which took place more than 20 years ago, and the enthusiasm of Skidmore, confirming the idea of organising a soil physics course was the start of one of ICTP's most successful activities: the College on Soil Physics.

After a first college in 1983, prepared and directed by Edward L. Skidmore and Donald M. Gabriels and co-directed by the local organizer Professor GianCarlo Ghirardi (ICTP consultant and University of Trieste), a number of colleges were organised every two or three years. Over time, more than 500 scientists, 80% of whom are from more than 50 developing countries, have participated in the College of Soil Physics, which in March 2003 celebrated its 20th anniversary.

In the course of these 20 years, Prof. Ildefonso Pla Sentis (previously at Universidad Central de Venezuela, at present with Universitat de Lleida, Spain), and Prof. Donald R. Nielsen, a former dean of the University of California, Davis, USA, joined the team of directors. Pla Sentis was long time coordinator of ELAFIS (Escuela Latinoamericana de Fisica de Suelos), sponsored by ICTP and organised for the first time in Peru (1986), and followed by courses in Brazil, Colombia, Argentina, Venezuela, Cuba and in 2003 in Chile.

Asked by 'News from ICTP' (see #104, Spring 2003) at the 20th anniversary College on Soil Physics, 'what soil physics means', Skidmore defined it in simple terms as 'the study of the physical characteristics of soil' or 'as the study of the physical laws of nature governing the behaviour of soil'. The study and potential applications of soil physics involve an understanding not only of physics, but of biology, chemistry, hydrology, engineering and land use management.

And Nielsen added that soil physics is not just an academic exercise. It involves implications for understanding present critical issues as food security, drinking water, pollution of waters, contamination of soils, natural disasters as
flooding and landslides. Soil physicists need to examine complex processes as water flow in soils, erosion and runoff, solute transport and oxygen diffusion.

Soil physicists belong to a big family and former participants of ICTP Colleges on Soil Physics take new initiatives to draw attention to the importance of soil physics for our environment. Reference is made to the symposia 'AgroEnviron' co-organized by former ICTP participants in Faisalabad, Pakistan (1998), Tekirdag, Turkey (2000), Cairo, Egypt (2002) and scheduled to be organised in 2004 in Udine, Italy.

The present book is a partial compilation of contributions from selected former participants of the College on Soil Physics invited to make presentations related to their achievements as a result of attending the College. It also serves as a testimony of the existing links between soil physicists throughout the world strengthened by the support and programs of the International Center for Theoretical Physics originally envisioned by Abdus Salam to foster the growth of advanced studies and physics research in developing countries.

Donald M. Gabriels and Edward L. Skidmore
Founding Co-directors
ICTP College on Soil Physics
Ghent University, Belgium

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