

## Foreword

SCOPE's Project on Biogeochemical Cycles, of which the present report is an important product, aims to build up a comprehensive basis of knowledge and understanding of the major biogeochemical cycles which together constitute the life-support system of our planet, determining as they do the composition of the atmosphere and the fertility of land and waters.

Widening and deepening our knowledge of these cycles has become especially urgent because man-made disturbances of the cycles are already quite substantial at a time when our demand for renewable resources for food, fuel, and fibre is increasing more and more rapidly. Our knowledge of budgets, fluxes, and transformation and transport mechanisms is still far from sufficient for predicting the limits to which the cycles can be safely exploited.

Interest in this complex problem was brought into focus by the USSR National Committee for SCOPE in a meeting which it organized in Moscow during November 1974. Much of the background thinking was published by Professor V. A. Kovda in *Biogeochemical Cycles in Nature and Their Human Disturbance* (1975), Nauka, Moscow (in Russian).

SCOPE's formal Project on Biogeochemical Cycles started in 1975 with an international interdisciplinary workshop on nitrogen, phosphorus, and sulphur cycles (the results of which were published in 1976 in SCOPE Report No. 7) and continued with another workshop and report on the carbon cycle (SCOPE Report No. 13). Further updating and synthesis is now taking place in co-ordinating units at Stockholm, on the nitrogen cycle, and at Hamburg, Stockholm, Woods Hole, and Brussels on the carbon cycle. Further specialized workshops were held on critical gaps in knowledge of these cycles and currently the project is focusing attention on the interactions of the major cycles. A report on this aspect is presented in SCOPE 21.

After the initial study in 1975 it soon became clear that a broader, more intensive effort would be required to complete our knowledge of the sulphur cycle, especially as the extensive work done in this area by our colleagues in the USSR had not yet been fully taken into account. Therefore, SCOPE gratefully accepted a proposal by the USSR Academy of Sciences to organize

an international workshop at Pushchino so that a major and comprehensive report on the global sulphur cycle could be prepared; this workshop was held in October 1979. Following SCOPE's general strategy, it reviewed the draft contributions and appointed an editorial board to prepare the final text of the report to be published in Russian as well as in English.

SCOPE is greatly indebted to the authors of the various chapters of this report, not only for their hard work and high standards but also for their patience and generosity in the second phase of the work, i.e. of amending and harmonizing the chapters to produce a coherent report. In this regard the work of the Editorial Board has been invaluable; without their persistence in overcoming language and postal barriers the present result would not have been achieved.

The generous hospitality of the USSR Academy of Sciences and the financial support of UNEP in this study are gratefully acknowledged.

Finally, it is a great pleasure to announce that one of the recommendations of the Pushchino workshop has already been implemented. SCOPE, the USSR Academy, and UNEP have jointly set up a Coordinating Unit for the sulphur cycle, located in Pushchino and directed by Professor M. V. Ivanov. This Unit will continue to collect and collate information on the sulphur cycle and will be of general assistance to all workers and institutions active in this field. Thus, SCOPE is not only indebted to Professor Ivanov for his energetic leadership in preparing this report but also for his willingness to continue his contribution to the SCOPE Project on Biogeochemical Cycles.

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