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Pollution and pollutant transport in the geosphere: Preface¹

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The main traditional field of earth scientist's professional activity has always been the exploration and exploitation of natural resources. Earth sciences have thus developed, from the last century up to now, in close relation with the needs of the society in natural resources. Before the first energy crisis that occurred in the early seventies, fossil energy and ores had dominated the orientation of research and teaching. However, the increasing demand of drinking water and construction materials, as well as the rapid growth of waste disposal problems gave birth to new regulations regarding environmental protection, and in particular, concerning the protection of surface and ground water, waste management and environmental impact studies. Hence, in many countries, environmental geology has become, together with engineering geology, one of the most important fields of activity of earth scientists (Müller-Merz et al. 1994, Eaton 1993).

Man-caused environmental pollution is mainly due to the emission of pollutants and to their transport in the geosphere, their storage and transformation by biological and chemical processes. The evaluation, prevention and cleaning-up of pollution requires a thorough understanding of the concerned natural processes. Consequently, the study of biogeochemical cycles in the environment represents one of the main topics of natural sciences in environmental research.

The understanding of the circulation of toxic compounds in the environment depends equally on two types of scientific factors and scales (see also Hoehn and Pfeifer 1994):

- 1 the microscopic factors related to the nature and composition, to the biological and physico-chemical behaviour of these compounds in the various environmental compartments, and
- 2 the macroscopic characteristics (climate, topography, vegetation, soils, geology, hydrology) of the environmental compartments and the physical and biological processes.

In environmental research on pollution problems, earth scientists act as a part of an interdisciplinary network covering both types of factors and scales mentioned above. However, the field is very large and an intense exchange of results within and beyond the frontiers of the disciplines will be essential for the improvement of our knowledge on biogeo-

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chemical cycles. Furthermore, interdisciplinarity has scarcely had any academic structures yet. In 1990, the Geological Commission of the Swiss Academy of Natural Sciences decided to create an interdisciplinary working group on environmental geochemistry, including scientists from the hard rock line, as well as from the sediment and water lines. Under the direction of Hans-Rudolf Pfeifer, this group has started the elaboration of the biographic data base TERDAT on existing geochemical information concerning rocks, sediments and water. These data may be used as basis for further research and for the understanding of exchange processes between the different layers from the lithosphere to the biosphere. Furthermore, this working group has organised the symposium on pollution and pollutant transport in the geosphere, and the success of the meeting has shown the high interest scientists take in this question.

This symposium has been organised in collaboration and with the support of the Geological Society of Switzerland and its Group for Hydrogeology, the Mineralogical and Petrographical Society of Switzerland, the Swiss Society of Soil Sciences and the Swiss Society of Hydrology and Limnology. In the name of the Geological Commission I would like to express my sincere thanks to all of these societies for their collaboration, and in particular to Hans-Rudolf Pfeifer and the working group on environmental geochemistry for having organised the symposium. This special volume of the Eclogae could benefit from the precious help of Hanspeter Funk.

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