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Lake Systems from Ice Age to Industrial Time

Preface of the guest-editors

DANIEL ARIZTEGUI¹ & WALTER WILDI¹

In the preface of the first ever published “monograph of limnology”, F.A. Forel (1892: VI) stated that “limnology is the oceanography of lakes”. This generous definition provided to the “science of the oceans of the continents” a scientific perspective for more than a century, from Forel to now, and most probably a prosperous future. As mentioned by the author (Forel 1892 : X-XI), lakes are in the centre of interest of scientists of many disciplines and of the population as a whole. Forel’s writing therefore covered a very large field of observation, including natural sciences, historical and socio-economic issues.

During the 20th century, lake research has become an internationally recognised field of scientific activity, improving our understanding on physical, chemical and biological processes, on fresh water ecology, and water resources among others. The interdisciplinary approaches mainly developed in historical research, as performed by archaeologists and earth scientists, to reconstruct the environmental and climate history of the continents, of human settlements and culture, and to evaluate human impact on the local and global environments. In Switzerland, research groups and laboratories linked to earth sciences have been established during the sixties in universities and federal schools of Bern, Geneva, Lausanne, Neuchatel and Zurich. Researchers at these institutions study lakes and fresh water systems all over the world, collaborating and linking their results to those carried out within the oceanographic realm.

As part of the annual meeting of the Swiss Academy of Natural Science, which was held in the city of Yverdon from 17 to 20 October 2001 under the title “Lacs - océans des continents”, the *Geological Society of Switzerland*, in common with the *Swiss Commission for Quaternary Research*, the *Swiss Working Group of Geophysics* and *S-Quat*, organized a scientific conference on “Lake Systems - from Ice Age to Industrial Time”. A large amount of oral and poster presenta-

tions showed the significant response of the research community to the knowledge on diverse aspects of lakes and lacustrine basins. As a result of this interest, the Geological Society of Switzerland publishes in the present volume a selected number of contributions presented during this conference.

A wide range of topics and methodologies are reported in the articles contained in this volume illustrating the potential use of lake sediments. The application of geophysical methods to disentangle recent tectonic activity in the Lake Neuchatel area is developed by Gorin et al. (this vol.). Analogously, the contributions of Baster et al. (this vol.) and Zingg et al. (this vol.) show the application of high resolution seismic to model delta formation in Lake Geneva. Beres et al. (this vol.), and Girardclos et al. (this vol.) further explore the use of this geophysical approach to determine 3-D geometries of the Molasse and lake sediments; and to reconstruct the wind history of the Late Quaternary of western Lake Geneva, respectively.

The application of lake sediments as archives of recent environmental change in northwestern Switzerland is illustrated by Gilli et al. (this vol.). Using a similar approach Blass et al. (this vol.) have calibrated, modelled and quantified sedimentary processes in a historically-formed proglacial lake. Subrecent and recent processes in Lake Geneva have been documented and interpreted using magnetic methods by Loizeau et al. (this vol.), whereas Olive et al. (this vol.) and Ulmann et al. (this vol.) have tracked fluid and sediment paths in the modern lake providing critical results to interpret older lacustrine records.

Forel (1892) had already identified as early as the end of the 19th century the importance of biological processes in lakes and visualised the use of biological remains as indicators of former environmental conditions. This approach is the base of Millet & Verneaux (this vol.), and Steinmann et al. (this vol.) contributions on the use of chironomid remains and sedi-

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mentary organic matter variations to reconstruct the Late Quaternary history of lakes Lautrey and Geneva, respectively.

The recognition of lakes as ideal sites for human settlement is well documented for the area of Lakes Neuchâtel and Morat in the article by Pugin & Corboud (this vol.). Today, the pollution of water bodies is the topic of major public concern. Lakes and rivers can provide excellent archives of the history of recent pollution as shown by Wildi et al. (this vol.) highlighting the application of lake studies to develop and design remediation strategies.

In summary, we are persuaded that the articles presented in this volume will be of interest for an audience that goes beyond the lake and lake-based studies community. Thus, we would like to thank the Geological Society of Switzerland for the opportunity to present some of the most recent scientific advances in the fields of limnology and limnogeology. We are indebted to F. Marillier (Univ. of Lausanne) and Ph. Schöneich (Univ. of Grenoble) for co-organising the Yverdon meeting, to J. Remane (Univ. of Neuchâtel) for helping in reviewing and structuring the manuscripts; and to all the authors for their discipline respecting deadlines; and to Christiane Grimm for the cover photograph. Last but not least this volume would not be possible without the valuable input of all the reviewers. We would like to thank E.W. Adams (Boston), P. A.-Allen (Zürich), J.-Ansorge (Zürich), F.S.-Anselmetti (Zürich), B.-Ammann (Bern), Ch. Beck (Chambéry), M.-Bensimon (Lausanne), E.-Davaud (Genève), J.A.-Dearing (Liverpool), J.-Dominik (Versoix), U.-Förstner (Hamburg), E. Franquet (Marseille), G.-Gorin (Genève), A. Hafner (Sutz-Latttringen), A.-Lini (Vermont), J.L.-Loizeau (Versoix), A.-Matter (Bern), J.-Mudry (Besançon), H. T. Mullins (Syracuse), F.-Niessen (Bremerhaven), A.-Parriaux (Lausanne), A.-Rieradevall (Barcelona), C.-Schlüchter (Bern), A.-Schwalb (Braunschweig), I.-Snowball (Lund) and M.-Sturm (Dübendorf).

In this early times of the 21-century the holistic concept of Earth System Sciences is widely recognised within the scientific community. We believe that the articles contained in this volume highlight the role of lake and rivers as ideal systems to apply and further explore this approach providing information on different issues of major societal interest.

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