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SIL news

Volume 50 - June 2007

In This Issue

Material for the December 2007 issue should be sent to the Editor by:

1 OCTOBER 2007

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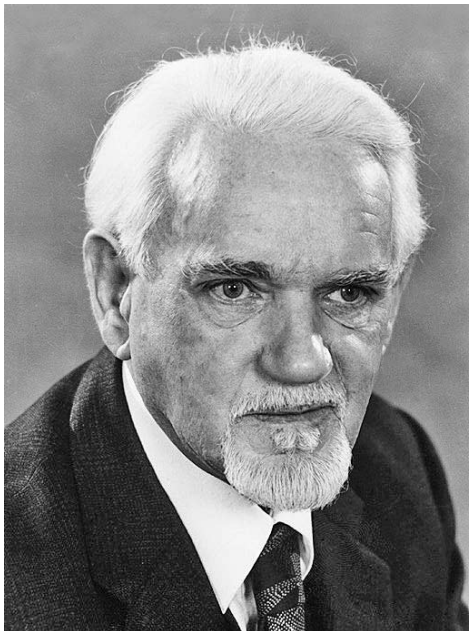
Contributions on a PC formatted disk, in any standard word processor or DOS (ASCII) text, or as e-mail attachments, will assist the Editor.

Obituary: Richard A. Vollenweider (1922-2007)

Richard A. Vollenweider passed away peacefully on January 20, 2007, at the Hampton Terrace Care Centre in Burlington, Ontario, after a long illness resulting from a stroke more than two years ago. He is survived by his loving wife, Roberta, his brothers Karl and Kurt, and his nieces and nephews: Irene, Franz, Marcel, Ursula, Werner, Walter, Silvia and Roland. Thanks to the staff of Hampton Terrace for attending to Richard's daily needs. Born on 27 June 1922, in Zurich, Switzerland, Richard completed a graduate degree at the University of Zurich. He studied the dynamics of life in inland waters in Sweden, Egypt and Italy before undertaking his monumental analysis of nutrients and plant growth in lakes (eutrophication) for the Organization for Economic Co-operation and Development (OECD). In 1968, he completed his now classic study under the OECD (Organization for Economic Cooperation and Development) in Paris of Scientific fundamentals of the eutrophication of lakes and flowing waters, with particular reference to nitrogen and phosphorus as factors in eutrophication. It was then that he was lured by Wally Johnson of the Fisheries Research Board of Canada to head the Great Lakes biological detachment at the Canada Centre for Inland Waters (CCIW) in Burlington, Ontario. Later Richard became Senior Scientist at the CCIW in the federal Department of the Environment.



A photo of Dr. Vollenweider taken in 1986 at the time he was awarded the Tyler Prize.

Richard's analysis under the OECD provided the foundation for a multi-million dollar, seven-year study under the International Joint Commission of transboundary pollution in the lower Great Lakes (1963-1970). It latter also paved the way for a major OECD study of the causes and control of eutrophication in 18 countries, at 50 institutes, and of 200 water bodies over a period of 15 years. For this and earlier work with OECD, he received an Award of Excellence from the Rawson Academy of Aquatic Sciences. He shared the prestigious Tyler Environmental Prize with Werner Stumm in 1986. Many honours and awards for Richard's work included the coveted Naumann-Thienemann Medal of the International Association of Pure and Applied Limnology (SIL) in 1987, the Premio Internazionale Cervia for work on eutrophication of the Adriatic Sea, membership in UNEP's Global 500 Role of Honor, and an honorary degree from the University of McGill. Enormous knowledge and uncompromising thoroughness were the prime qualities that characterized his work. Richard paved the way for the study of inland waters and their drainage basins as open systems - rather than as microcosms. It is extraordinary that his 1966-68 OECD study was never properly reviewed or published in the scientific literature; nevertheless, it achieved the level required for recognition as a Citation Classic based on the number of citations in the scientific literature. Richard loved the mix of good conversation, food and wine. It was these characteristics, in fact, that brought him and Wally Johnson together. One of these occasions was at a Spanish restaurant in Paris after a

heavy, day-long OECD meeting. That evening later decided the matter: Richard, if offered the opportunity, would later move to Canada.

At the CCIW, Richard protected people and functions vital to good research when they were threatened with bureaucratic redirection or closure for trivial reasons. In every sense, he was well suited for the role as Senior Scientist at the CCIW. He was a leader. We are honored to have had him in our presence.

J. R Vallentyne
Senior Scientist (1977-1992),
Department of Fisheries and Oceans
Canada Centre for Inland Waters

(Note: Editor SIL News: Some minor additions at the beginning of the article are based on information received by me from Richard Robarts).

Reports

Limnology At Plön to Vanish. An Indication of a General Trend?

In December 2006, a large crane pulled up the "Plankton Towers" through the roof of the Max Planck Institute for Limnology at Plön, Germany. This was visibly the end of the Department of Physiological Ecology, and, as many people said, "the end of a long and influential period of limnological research at this institute". In fact, my department was already closed when I retired in September, 2006. The River Station at Schlitz, a part of the institute at Plön for more than 50 years, was closed also at the end of November 2006 with the retirement of Peter Zwick. The Tropical Working Group will close down as well when Wolfgang Junk retires in June 2007. On 1 July 2007, the institute will be renamed as Max Planck Institute for Evolutionary Biology.

However, all these changes do not imply that the Max Planck Institute at Plön is under any distress. On the contrary, the Max Planck Society (MPG) has decided to expand the institute by investing more into new buildings, and establishing a third department. Those not familiar with the situation may find it difficult to understand this decision. Wherever I went in the past months, I was confronted with heads of the professional colleagues shaking and I even heard comments like: "How can you destroy one of the leading limnological institutes in Europe with such a long history?". Founded in 1892, and headed by August Thienemann from 1917 to 1957, this institute has had definitely an impressive history. It is gratifying to hear that colleagues still have such a high opinion of the work done at Plön until recently. Why end this era? The answer is rather complex because it is not only an internal decision of the MPG, but also reflects the general trend in the development of limnology in Europe.

In order to understand the changes, one first needs to have a good grasp of the mission of the Max Planck Society for the Advancement of Science, which runs 80 institutes, mainly in Germany. It is a unique institution worldwide as it is not only explicitly devoted to fundamental research, but it also gives its scientific members (usually directors of a department in an institute) complete freedom to choose their research topics provided it is a cutting-edge research. There is no direct or indirect influence on research matters by politics or funding agencies. This is guaranteed by sufficient institutional funding (95 % from public sources) to run a department at high standards. Of course, institutes can acquire additional external funding, but this is not essential. These are dream conditions for a researcher. On the other hand, the MPG is expected to continuously work to keep at the fore-front of science. There is no room for routine or repetitious work. The consequence is a tight, biannual international evaluation of the work, and more importantly, a thorough review of the field of research when the director retires. The basic assumption is that within the 20 to 25 years of a director's stay at the MPG, his field should be an established science and should be continued elsewhere. Long traditions do not count. The resources must be exploited to start a new challenge.

During the past 90 years, there has been a continuous change in the research topics at the Max Planck Institute for Limnology. August Thienemann's holistic ecosystem concept was

Removal of the Plankton Towers through the open roof of the Max Planck Institute for Limnology at Plön, 18 years after their installation in 1988. (Photos: G. Augustin)

followed by the landscape ecology approach of Harald Sioli working on the Amazon River. Jürgen Overbeck started with aquatic microbiology, and I came with a new concept of evolutionary, physiological ecology of aquatic organisms, combining physiology, population biology and population genetics. It was a logical step to go further into the evolutionary direction by hiring an evolutionary biologist, Manfred Milinski, who succeeded Jürgen Overbeck. The extraordinary progress of biological sciences in recent years is based on the rapid development of molecular tools. This is the research area where further breakthroughs are to be expected. Consequently, the position of my successor was announced for molecular, evolutionary ecology and experimental evolution. Unfortunately, there was no applicant who could be called a limnologist in the widest sense.

In view of the special mission of the MPG, we have to accept the final decision. Although several colleagues of the Scientific Advisory Board of the Max Planck Institute for Limnology and I tried very hard, we were evidently not able to put up a convincing case of any anticipated breakthroughs in limnology in the coming years. What makes limnology unappealing for a high-pitch scientific organization? There seems to be a discrepancy between the growing importance of limnology with concerns about global water resources and climate change, and the expectations of new discoveries. In my view, may be I am subjective, the main reason for this present situation is a general trend in limnology to embark on applied issues because of political pressure to solve water-quality related problems. At least in Europe, limnology as a whole did not lose importance, but curiosity-driven, fundamental research with potential for discoveries and the development of new paradigms is declining. I begin to agree with Joop Ringelberg, the famous Dutch limnologist, who already in 1993 complained about limnology becoming a purely applied science. However, I cannot make a distinction between "limnology" and "aquatic ecology" as Ringelberg did.

Plön is not the only place in Europe with a long limnological tradition that is affected by new developments. The famous Windermere Laboratory, run by the FBA, went through a serious crisis recently when NERC withdrew its personnel and funding. FBA on its own was not able to maintain the Ferry House (cf. Alan Hildrew's article in SIL News 49). It had to be sold in order to save other buildings and continue limnological research on a smaller scale; nevertheless, one may expect that contract work will play an increasingly important role at Windermere in the future. The institute at Pallanza, which was described as "haven for visiting limnologists" by Tommy Edmondson, is now part of a large governmental organization concerned with environmental issues. There seem to be plans to move the Centre of Limnology at Nieuwersluis in the Netherlands to the campus of the Agricultural University of Wageningen, which may also be an indication of applied research being intended to play an increasing role in the future (see article by Riks Laanbroek in this Issue).

One of the driving forces for limnology to become a predominantly applied science is the European funding system where funding by the EU has become more and more important. EU funding is driven by political issues, as the "socio-economic impact" of a research project has gained an overwhelming importance for funding success. This strategy does not favour creative, risky research; it rather supports the safe re-invention of the wheel. My experience as an editor shows me a renaissance of classification and descriptive studies in limnology, although with the new tools for multivariate statistics available, the description is on a higher academic level.

To make my opinion very clear: I believe that applied science is very important and can be a creative science. For example, Tommy Edmondson and Hans-Joachim Elster impressed me enormously with their fruitful blend of fundamental and applied work. We have many problems that must be solved quickly. But I am afraid that the concern expressed by Pete Jumars already in 1990 is still valid: "Although the need for applied limnology is obvious, it is arguably less obvious that it is impossible to apply knowledge that one does not yet have: sound understanding of basic limnology is prerequisite to sound management". Does the declining interest in fundamental limnology mean that we already have the "sound understanding"? Do we train our students with the perception that limnology has no longer surprises and discoveries to offer? Sometimes, going to conferences I get the impression that this is an agreed opinion. If it is the case, then limnology is in fact no longer a subject for the Max Planck Society, and nobody should complain about the end of an era at Plön.

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Winfried Lampert
Plön, Germany

The Institute for Hydrobiology at the Dresden University of Technology: More than a Century of Hydrobiological and Limnological Traditions

The Institute for Hydrobiology originated from the former Branch for Drinking-, Industrial- and Wastewater Biology (Abteilung Trink-, Brauch- und Abwasserbiologie) at the Zoological Institute of the University of Leipzig. Thus, it assimilated seven decades (1898–1967) of traditions in hydrobiology at the University of Leipzig, as well. The Leipzig tradition in hydrobiology strongly influenced other universities. Moreover, it is closely connected with several distinguished scientists as Carl Chun, Richard Woltereck, Arno Wetzel, Erich Wagler, Hans-Joachim Elster and Hans

Field sampling and emergence trap: the impact of climate change is studied by year-to-year variation of the benthic-pelagic coupling in Saidenbach Reservoir, which includes regular plankton sampling and gathering emerging chironomids (Photo: A. Wagner).

Liebmann. The institute was transferred to Dresden in 1967 as a part of the Department of Hydrosciences at the Dresden University of Technology. This department was established during that time by Karl-Franz Busch, a civil engineer, as an interdisciplinary consortium of engineers, biologists, hydrologists, meteorologists and chemists. The positive feedback effects of this multidisciplinary consortium are reflected in the general research approach of integrated water management. Moreover, for German standards it is even exemplary vis-à-vis teaching philosophy within the study courses for water management, hydrology, waste management, and hydrobiology. This last, hydrobiology, is one of the five possible specializations within the study course of biology. Dietrich Uhlmann was the director of Institute from 1967 through 1994, and since 1995 Jürgen Benndorf is the director. Thus, starting with Carl Chun´s appointment at the University of Leipzig in 1898, the Institute of Hydrobiology looks retrospectively at more than a whole century of hydrobiological/limnological teachings and research.

At present, the institute has two positions of professorship, namely Limnology (J. Benndorf) and Technical Hydrobiology/Ecotoxicology (R. Nagel). The institute is located at Drude-Bau about 2 km from the main university campus. The limnology working group comprises 14 scientists, 4 technicians and a varying number of graduate students (see at www.tu-dresden.de/fghhihb). For many years, the working group focussed on three main research areas:

(1) top-down structuring of food webs by fish predation in pelagic communities of stratified lakes and reservoirs (Benndorf et al. 2002) and of benthic communities in small streams (Winkelmann et al. 2003);
(2) develop, test and apply the ecological model SALMO to stratified lakes and reservoirs (Benndorf & Recknagel 1982); and
(3) biochemical ecology of cyanobacteria, with main focus on the ecological aspects relating to microcystin production (Ihle et al. 2005).

A fourth topic that has been added recently, focuses on changes in match/mismatch events in lake communities, stimulated by climate change (Wagner & Benndorf, in press). The basic objective is to combine long-term field experiments, short-term mesocosm studies, laboratory experiments and mathematical modelling. We think that such an integration will reinforce the strong points of individual approaches. We hope that the traditional topics will be further developed and supplemented by new ideas in 2008 when a new director will succeed J. Benndorf.

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J. Benndorf
Dresden, Germany

50 years of Limnology at Nieuwersluis: Past, Present and Future

In the 1950s, scientists in the Netherlands became conscious of the necessity to study the biology of aquatic systems using a multidisciplinary approach. This was in line with some earlier initiatives in some other countries in Europe. At that time, such an approach was quite inconceivable at the Dutch universities with their rather strictly discipline-oriented departments. In 1957, exactly 50 years ago, the Royal Netherlands Academy of Arts and Sciences took the initiative to found the Hydrobiological Institute. The most appropriate location for such an institute was the lake area of the province of Utrecht in the centre of the country. A nineteenth century mansion 'Vijverhof' in Nieuwersluis, a small village on the bank of River Vecht, was bought to accommodate the Institute's research laboratory. Already some months after this, a branch of the Hydrobiological Institute was established in the delta area of the rivers Rhine, Meuse and Scheldt in the south-western part of the country. It became an independent research institute soon thereafter. The aim of this 'sister institute' was to scientifically follow the large restructuring of the hydrology and physio-geography of the delta area, prompted by severe flooding event in this area of 1953, in which many people died.

In 1968, the name of the institute at Nieuwersluis was changed to Limnological Institute to emphasise on the importance of interactions between biology and physico-chemical characteristics of inland waters. In the framework of the International Biological Programme (IBP), the Institute at Nieuwersluis got a field laboratory at Lake Tjeukemeer, one of the major Friesian lakes near the village of Oosterzee in the north of the country. Research in that period was concentrated on two lakes: 1) Lake Tjeukemeer, a large (1800 ha), shallow and well mixed peaty lake, with strong impact of surface water hydrology; 2) Lake Vechten (< 5 ha), a small but deep, stratifying sand-pit with little surface water inflow. The research studies in these lakes related mainly to the

The Villa "Vijverhof," a nineteenth-century mansion at Nieuwersluis, the Netherlands, where it all started in 1957 (see text). Soon too small for the ever-expanding research needs of the growing institute, two new laboratories and office accommodation for research staff were built on premises of the Villa Vijverhof in the 1970s and 1990s, respectively. At present, the Villa houses the administrative staff of the Netherlands Institute of Ecology and offers accommodation for guest scientists visiting the Centre of Limnology. Historically, the Villa Vijverhof derives its name from the pond (= Vijver in Dutch) in the back yard of the building.

ecology of algae, food-web and productivity and biogeochemical processes at the sediment-water interphase (Lake Vechten especially). The major results of studies on these two lakes have been published in the proceedings of a symposium organized to commemorate the silver jubilee of the Limnological Institute in 1982[1].

In 1988, an internal reorganization of the institute was initiated by the Royal Academy. This paved the way for a major reorganization of the research that led to the closure of the Tjeukemeer laboratory and shifting of the personnel to Nieuwersluis. In 1992, the Limnological Institute merged with two other ecology-oriented research institutes of the Royal Academy into the Netherlands Institute of Ecology (NIOO, in Dutch) and simultaneously the Centre for Limnology was established as one of the three research centres of the NIOO. The foremost reason for this merger was the unequivocal opinion that aquatic and terrestrial ecologists can learn a lot from each other with respect to the basics of ecology; the second reason was the reinforcement of science-supporting, auxiliary services.

The research programme at the Centre for Limnology was rescheduled by establishing two new departments, in addition to the existing Food Web department, namely the departments of Microbial Wetland Ecology and Plant-Animal Interactions. The research in the newly created departments focussed more on the littoral zones of shallow lakes and wetlands. The research of the Food Web department became more connected with ecological and evolutionary mechanisms affecting trophic interactions. In the meanwhile the co-operation with the Dutch universities was further strengthened and the Centre for Limnology participated in research activities of the Centre of Wetland Ecology. This wetland centre is a formalized collaboration between the universities of Amsterdam, Nijmegen and Utrecht.

All these years, the Centre for Limnology and its predecessors have been involved in a number of international collaborations. Every 6 years, the Centre for Limnology and its departments are reviewed by an international panel of experts. In the latest evaluation in 2005, the Centre has been rated "good to almost excellent" by this panel. Coinciding with this last evaluation, the Royal Academy decided to move the Centre of Limnology and the Centre for Terrestrial Ecology to a common building on the campus of the Wageningen University. So, after 50 years in the centre of the Dutch Lake District, limnology will move to a place closer to the river Rhine. This will undoubtedly affect our research, but we hope that limnology will continue to flourish in the Netherlands, a country rich in inland waters of various types, size and character.

The Centre for Limnology will celebrate its 50th anniversary this autumn. The activities planned include a scientific symposium, to be held in the last week of September, dealing with water problems and their solutions. An open day for general public, and reunion of the (former) employees is planned on Sunday October 21 at Nieuwersluis. All interested are welcome.

See the Centre's website (http://www.nioo.knaw.nl/CL/) for additional information.

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Riks Laanbroek
Nieuwersluis, The Netherlands

SALIENT NIEUWERSLUIS DATA AND FACTS

- In its 50 years of existence, the scientific staff of Centre for Limnology published 519 scientific articles in peer-reviewed journals by 101 different authors and co-authors. These articles together have been cited almost 9000 times.
- In these years, about 50 people successfully defended their Ph.D. theses at the Centre.
- Six different directors guided the successive research programmes of the Centre and its predecessors, namely Dr. Emy Nicolai (1957 – 1961), Dr. Han Golterman (1961 – 1978), Dr. Rob Soekarjo (1972 – 1978), Dr. Sikko Parma (1978 – 1992 Prof. Wim van Vierssen (1992– 1993) and Prof. Riks Laanbroek (1993 – present).

Limnology in Brazil: From Descriptive Research to Theory and Applications

1. An Introduction to the Background of Limnology in Brazil

Brazil is a country well endowed with water resources that comprise large river floodplains, extensive wetlands, natural lakes in tropical forests and small creeks and rivers that occur over a vast range of latitudes (from 5° North to 39° South). In addition to a vast array of continental freshwater ecosystems, Brazil has 8.000 km of coastline with several estuaries, coastal wetlands, coastal lagoons and temporary saline lakes. Inland waters in Brazil form two main watersheds: the Amazon and the Plata Basin, which constitute important hydrographic components of the neotropical and subtropical regions of the South American continent. Brazil shares these watersheds with eight other countries in the Amazon region and with four countries in the La Plata Basin area.

The Pantanal Wetlands (200.000 km^2) in the headwaters of the La Plata Basin and the vast internal deltas of the Amazon River and its tributaries are large regions with dynamic ecology and hydrology. The fisheries, navigation, and "varzea" cultivation are integrated in spatial and temporal scales.

This vast and diverse neotropical ecosystem attracts a great number of travelers, botanists, zoologists and explorers. Many such visitors have described the wonders and marvels of this new world where "water, people, fishes, animals, trees" interact with a vast and colorful landscape (Wallace, 1853; Bates, 1863).

If this was the realm for many a naturalist during the 18th and 19th centuries, the 20th century was the age of Limnology in Brazil. Studies at the end of 19th century by Oswaldo Cruz, a medical doctor, specialist in sanitation, contributed to improving the sanitation in Rio de Janeiro. He described "a new apparatus for sampling bacteria in water" (Cruz, 1883). The roots of Limnology in Brazil are linked to an extent to applied works for improving sanitation and to understanding the causal factors for water borne diseases as well as to improve fisheries and fish production.

Despite the presence of several natural freshwater ecosystems in Brazil, there are also many man-made reservoirs, constructed at the end of 19th century, especially in the northeast part of the country, for water supply and fish production. Later, large reservoirs were built for electricity production. During the period 1950-1970, more than 100 large dams (some with capacity of 40-50 km^3) were constructed in the La Plata Basin area (South-East Brazil) and in areas of Amazon Basin and São Francisco River.

The first published book on Limnology (in Portuguese) was authored by Dr. Herman Kleerekooper, a Canadian fishery biologist working in Brazil. It mainly deals with preparing a limnological basis for improving fisheries production in small, shallow reservoirs.

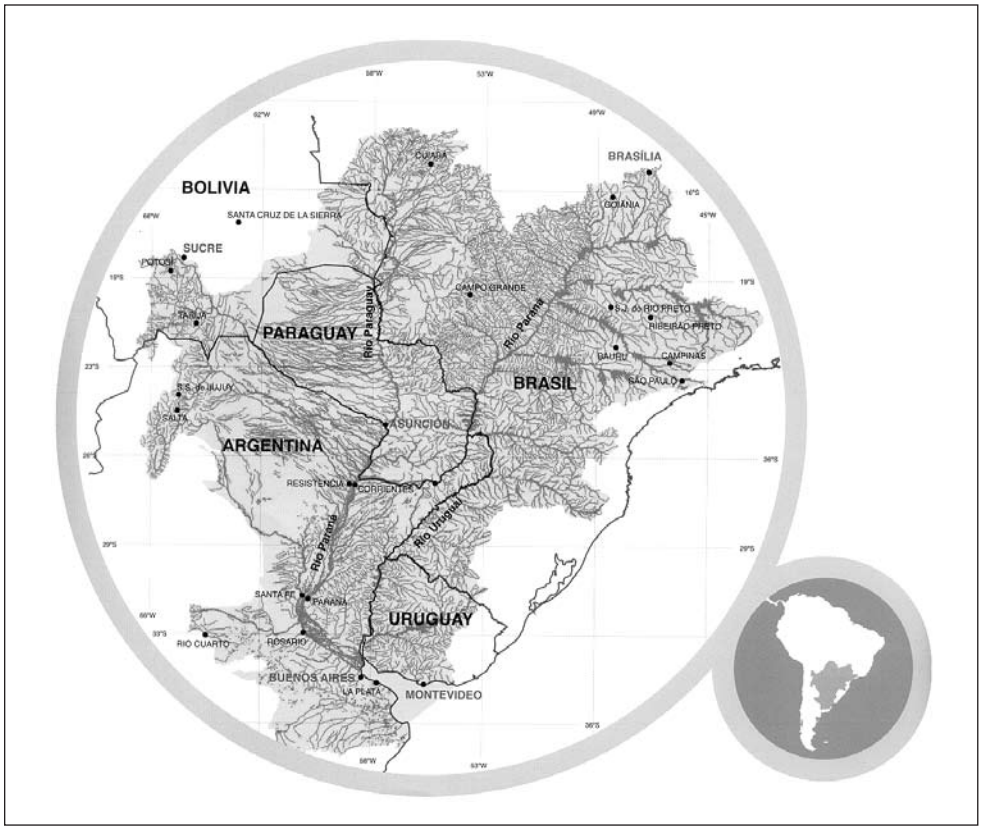
2. A New Start After the 1970s!

Until 1970, Limnology in Brazil was a descriptive science, linked to sanitary engineering and fisheries with some studies dealing with phytoplankton, freshwater algae, zooplankton and fishes. The construction of large new dams attracted attention of biologists and ichthyologists to study reservoirs with a more systemic view. Studies in the Amazon region by Sioli in 1950 (Sioli, 1984) gave a stimulus leading to the foundation in Manaus of the National Institute of Research in the Amazon, an initiative of the Brazilian Government. The cooperation between the Brazilian and German scientists in varzea lakes and the floodplain, and subsequently by those from Brazil, France and the United States paved the way to develop a strong approach towards basic research (Sioli, 1984; Junk, 2000).

Starting in 1970, the Brazilian government implemented postgraduate programs in ecology for supporting students and for professional activities in the public Universities. During the 1970s and 1980s, the research themes in limnology constituted basic research in natural lakes and artificial reservoirs, studies on primary productivity, biogeochemical cycles, limiting factors to productivity, zooplankton and benthos distribution. Furthermore, the researches on macrophyte distribution and productivity, decomposition processes and sediment-water interactions were developed with emphasis on experimental and fieldwork.

The founding of the Brazilian Society of Limnology in 1982 by 23 members was another step forward. Today, the society has some 800 members.

In addition to the encouragement of basic research in the 1970s and 1980s, there was an urgent need for applied research. This was related to the management of large reservoirs, water quality of rivers and lakes and water supply systems to meet the demands of the large-scale urbanization in Brazil and fisheries management in reservoirs. Large-scale, comparative studies were launched on a continental basis in order to understand the principles of functioning of the freshwater ecosystems, and finding solutions the problems of contamination, pollution and eutrophication. Studies on sediment chemistry, eutrophication, biological indicators and efforts to contribute to the recovery of aquatic ecosystems were developed further. It was in the end of the 1980s and in the beginning of the last decade of the 20th century that the studies on microbial aquatic ecology started to gain relevance. Also, efforts to study coastal lagoons started at this time.



This map shows the whole La Plata Basin that is shared by 5 countries; it is the most impacted and most studied watershed in South American continent (Source: Intergovernmental Committee of the La Plata Basin – 2005).

The successful organization of the 26th SIL Congress in Brazil, in 1995, was another landmark achievement of the Brazilian limnologists. One thousand and sixty five scientists from 65 countries participated in this congress. Four hundred Brazilian Limnologists presented 470 papers, discussed projects and perspectives with eminent scientists and attended 20 plenary lectures by international authorities in Limnology. The Scientific Community on Brazil prepared for the SIL congress a book, "Limnology in Brazil" (Tundisi, Bicudo and Matsumura-Tundisi, 1995), which described the "state of the art" of the science up to the SIL Congress.

During the last ten years, knowledge obtained from limnological researches in Brazil has been rigorously applied in many regions of Brazil. This involved an active participation of post-graduate students and post-doctoral fellows and large number of publications. The main objectives of these studies included protection of watersheds; recovery of rivers, lakes and reservoirs; fisheries management; water quality for public supply; detection and control of cyanobacterial blooms; biological indicators and wetland management. Theoretical contributions on the functioning of food chains, functioning of pulsing systems in the Amazon region, Pantanal and Paraná watershed, improved substantially the quality of the applied work. More recently, the interaction among limnologists with private initiatives has increased in order to meet the societal needs.

3. The Teaching of Limnology and Capacity Building in Brazil

The Program of Ecology and Natural Resources at the Federal University of S. Carlos, started in 1976, was the first program to develop an emphasis on Limnology and Aquatic Sciences. More than 400 Ph.D. were trained and several research groups in limnology and oceanography were formed. Now, several of the 32 post-graduate programs in Brazil highlight the importance of and give emphasis to Limnology, Aquatic Sciences and Aquatic Biology and Ecology. Training courses are organized each year with a strong participation of young limnologists and managers.

The efforts of Brazilian limnologists to develop this science in Brazil are now bearing their fruits: publications in international journals have increased, and there are more than sixty books and synthesis papers in Portuguese.

The researchers now have access to several national and international journals. They now use these journals for publication of their results. The Brazilian Journal of Biology and Acta Limnologica Brasiliensia are the most common utilized venues for publication of papers by Brazilian and foreign scientists working in Brazil.

Summing up, limnology as a science in Brazil has grown from a scattered effort to a strong and organized science, which is now contributing importantly to the improvement of our knowledge of biological and ecological processes in the neotropical aquatic ecosystems. The vastness and complexity of the natural and large artificial ecosystems has had been a a challenge but it has been very well met by the past and present generation of scientists that are also contributing to a great extent to improve quality of life of the people in Brazil. It is no coincidence that the theme of the next general meeting of the Brazilian Society of Limnology is "Water for Society".

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As Lake Tanganyika Warms, Uncertainty About Impact on its Primary Productivity and Fish Production Simmers

Water temperatures in Lake Tanganyika have increased over the past century[1,2] with surface waters warming more than deeper waters. Consequently, the vertical density gradient is steeper and vertical mixing may be reduced[1]. Similar changes have been observed in Lake Malawi[3] and are predicted for the global ocean under rising CO_2 levels and global warming[3,4]. Because Lake Tanganyika is meromictic, organic matter that sinks out from the surface layer and decomposes in deep water imposes a strong nutrient-depth gradient. Flushing time for Tanganyika is about 1000 years and most of the catchment is still relatively pristine so land catchment influences are minor. Nutrient loading to the mixed layer is consequently dominated by vertical mixing. Reduction in vertical mixing should result in less nutrients (in particular PO_4) now being returned to the surface layer and productivity would be expected to slow down[1,2]. Evidence supporting a decrease in primary production rates over the past century includes decreased phytoplankton biomass[1], increased transparency[1], and a decrease in $\delta^{13}C$ in organic matter in sediment cores that is considered to be a proxy for primary production[2]. In addition, dissolved silica in surface waters[1] has increased indicating decreased growth by diatoms. Also decreased fish catches were considered to be caused by decreased primary productivity[2]. The process (Figure 1) has now also been recognized to occur in the stratified waters of the global ocean[4].

The primary productivity in Lake Tanganyika was estimated at 290 g C m^{-2} y^{-1} in 1975[5] and is expected to have decreased since then. In contrast, higher rates varying from 426 to 662 g C m^{-2} y^{-1}, depending on which method was used, were reported for 1994-1996[6]. The lower range of the estimate used *in situ* methods that were most comparable to those used in 1975. *In situ* measurements were made at three locations: north end, mid lake and south end. The north end location is at a productive shallow shelf around which human population density is much higher than elsewhere on the lake, and nutrient pollution from the watershed has become increasingly prominent. If data from the north end are excluded from the analysis, productivity decreased by 33% since 1975 with mean rates of 193 g C m^{-2} y^{-1} for the two more southerly stations.

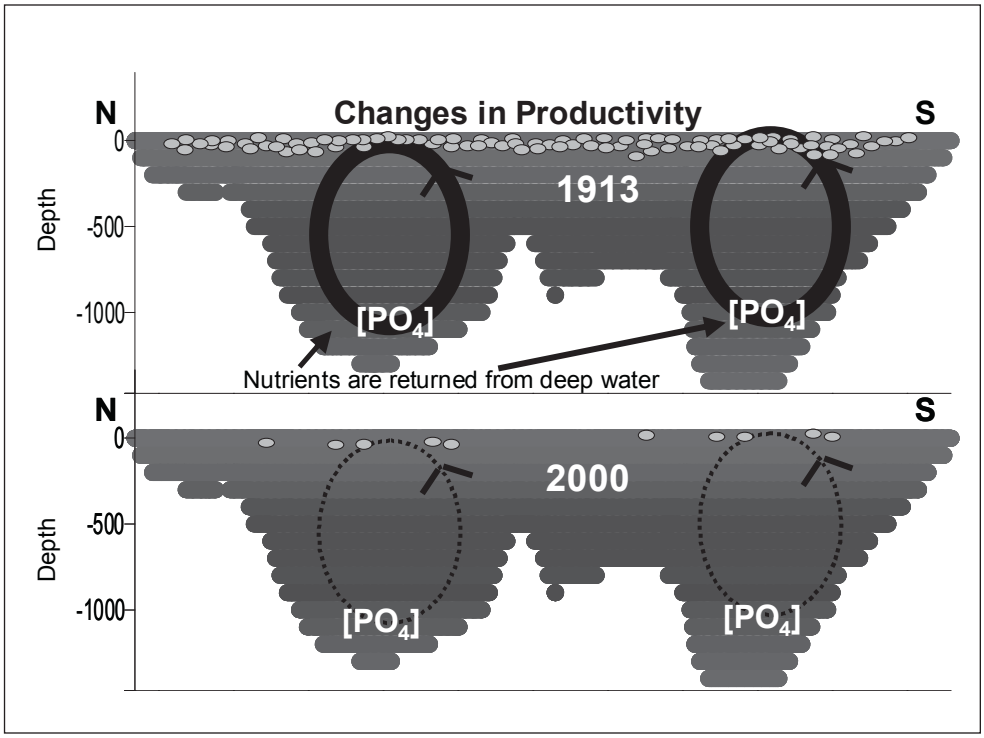

Figure 1. A diagrammatic depiction of the effect of climate warming on lake Tanganyika in a diagram, comparing the state in 1913 (top) with that in 2000 (bottom)[1]. Because the density gradient increased between deep and shallower waters the vertical mixing has slowed down, less nutrients are now returned to the surface layer and, therefore, productivity has decreased.

The sediment record can provide an excellent alternative to real-time data over long time periods if properly interpreted. If $\delta^{13}C$ in organic matter in the sediment is used as a productivity proxy it must be corrected for the decrease in $\delta^{13}C$ in the atmosphere over the past century caused by fossil fuel emissions (the Suess Effect)[10]. The correction has been shown to be necessary and demonstrated to be crucial for the proper interpretation of $\delta^{13}C$ records[10]. The correction has been applied to data of Lake Tanganyika[2], but an error in the methods produced "corrected" $\delta^{13}C$ values that were lower instead of higher than uncorrected values[10]. The error increased towards the end of the past century with increasing fossil fuel emissions and decreasing atmospheric $\delta^{13}C$[10]. With the correction applied properly, there was on average no decrease in $\delta^{13}C$ in the sediment cores over the past century[10]. However, the sediment cores were collected very close to shore in shallow water near inflowing streams[2], and the cores may not be representative for the pelagic[9]. Ironically, several of the cores were collected near streams in the north of the lake with highly disturbed watersheds[2,10] and these cores after correction for the Suess Effect in fact show the effects of inshore eutrophication instead of the alleged offshore decrease in productivity. Therefore the search is still on for evidence in the pelagic sediment record for the decrease in productivity over the past century.

While it is reasonable to expect that a decrease in pelagic primary productivity as a result of climate warming would have affected the fish stocks, this has not been substantiated with data[7,8,9]. We agree that the report of decreasing fish catches[2] in Lake Tanganyika was not correct[7,8]. In fact, the last reported lake-wide annual fish catch in 1992 was the largest ever reported[11], because fishing effort has been increasing continuously since the start of the offshore fishery in 1950[11]. Unfortunately, claims of decreasing fish catch by climate warming were disseminated widely by the global media. While the increased fishing effort may now actually be depleting the fish stocks, the last reported lake-wide annual catch data are of 1992. We are now in the 15th consecutive year without lake-wide monitoring and reporting of fish catches in Lake Tanganyika. There is, therefore, a need for uninterrupted monitoring of fish catches and for an accessible compilation of the data for all four riparian countries (D.R. Congo, Burundi, Tanzania, Zambia). Because the fish stocks of Lake Tanganyika are an immensely valuable resource to these countries, they must be protected. While climate warming may have had an effect on fish stocks, wise management by the stake holders remains important to the sustainability of the fishery[8].

More continuous monitoring in Lake Tanganyika (and the other African Great Lakes) of nutrient concentrations, phytoplankton biomass production and fish production over the latter half of the last century would have provided clearer answers that we now need to determine impacts of global warming on these unique ecosystems. Instead, we have a disagreement[7-9] that sufficient evidence has been provided for the conclusion that climate warming has reduced productivity in Lake Tanganyika and that further long-term research will be necessary to discover trends before conclusively deciding the matter[8]. We agree with the need for more regular and extensive measurements on fisheries, primary productivity and nutrient data using common methodologies in the African lakes, but we remain convinced that the case is strong for decreased productivity as a result of climate warming[9]. Waiting for the results of more studies before invoking the real risk of climate warming to the productivity of Lake Tanganyika would violate the precautionary principle and would marginalize these unique, ancient tropical lakes and their invaluable fisheries and biodiversity in the global climate debate.

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Gas-Charged Lakes: The Killers Are On Notice, But Not Yet Stopped

Lakes may claim lives occasionally with drowning or boating accidents. However, we rarely thought of lakes as outright killers until in the mid 1980s when we heard that Lakes Nyos and Monoun in Cameroon exploded, killing approximately 1,800 people by asphyxiation with CO_2. So far, only three such dangerous lakes are known (Lake Kivu is the third), and the rarity is because even though sources of CO_2 and methane gas are plentiful worldwide, the probability is very low that these gas sources would discharge directly into the bottom of deep, strongly stratified lakes where the gas can accumulate to build up to a dangerous pressure level; at Lake Nyos gas pressure is estimated to be over 18 bar at lake bottom, and the total CO_2 content over 500,000 metric tons.

Once these phenomena were understood, scientifically, international efforts to mitigate the hazards led to installation of degassing pipes in Nyos in 2001 and Monoun in 2003. The pipes have reduced the gas content in both lakes, and the lake stability (resistance to an uncontrolled gas release) has been maintained. However, even with the gas contents lowered, Nyos contains more gas than was released in the 1986 disaster, and still poses a grave threat to local populations. Moreover, the natural dam at Lake Nyos is weak and vulnerable, and when it fails a flood could affect five to ten thousand people living in the valleys below the lake. The dam can be strengthened immediately, and once most of gas has been removed the lake water level may be lowered to completely eliminate the flooding

Figure 1. Degassing fountain (~50 m high) at Lake Nyos. Photo by G. Kling

threat. It is clear that additional degassing pipes are required to reduce the time frame of danger and the risk of further disasters.

On the other side of the continent lies Lake Kivu, the giant, menacing big brother of Lake Nyos. Compared with Lake Nyos, it is 1,600 times greater in surface area, contains 1,000 times more CO_2, and holds a stockpile of methane that is the 5th largest in the world. The major concern in the case of Lake Kivu is that methane pressure has increased by approximately 15% in the last 30 years, and may reach saturation level within 100-200 years. Coupled with local volcanic activity that could provide the energy to destabilize the lake and trigger a massive gas release, this situation makes Lake Kivu the world's largest ticking time bomb. Although there are no historical records of gas bursts at Kivu similar to those in Cameroon, there is evidence from sediment cores for large disturbances in the lake that could be related to gas discharges in the last 5,000 years.

The very devil that helps create the monster Kivu, the methane gas, may actually turn out to be a boon for the millions of people living around the lake. A proposed project of large-scale gas extraction will use the methane as fuel in power plants to generate electricity. With a pilot plant being built, and several platforms operating in the future, it is hoped that the gas pressure at Kivu will decrease to help avoid a potential human disaster. We now understand that these gas-charged lakes undergo a natural cycle of recharge and release, and that unless the cycle is short-circuited by our intervention, we can expect further lethal gas releases in the future.

For More Information:

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http://www-personal.umich.edu/~gwk/research/nyos.html

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Studies on Ethiopian Rift Valley Lakes: Swedish Support for Ph.D. Training Program

The Department of Limnology at Uppsala University has been engaged since 1993 in a Ph.D. training programme at the Addis Ababa University, sponsored by the Swedish Agency for Research Cooperation (SAREC). In this programme both of us (the undersigned) have served as supervisors for five Ph.D. students, who all studied the Ethiopian Rift Valley lakes. The last one among them successfully defended his thesis at the Addis Ababa University in December 2006. The students and their topics of research and year of graduation were:

- Demeke Admassu: Age and growth determination of tilapia (*Oreochromis niloticus*), 1998.
- Zenebe Tadesse: Food and feeding ecology of tilapia and effects of diet on lipid quality of fish, 1998.
- Elias Dadebo: Reproductive biology and feeding habits of some commercially important fish species, 2002.
- Yosef Tekle-Giorgis: Age and growth assessment of Nile perch (*Lates niloticus*), catfish (*Clarias gariepinus*) and tilapia, 2002.
- Girma Tilahun: Seasonal variation in species composition, abundance, size-fractionated biomass and primary production of phytoplankton in lakes Ziway, Awassa and Chamo, 2006.

All these students have now a teaching or a research position in Ethiopia. However, our first contact with Ethiopian limnology started when we supervised Elizabeth Kebede Westhead. She defended her thesis on phytoplankton in Ethiopian lakes at Uppsala University in 1996, and now holds a position at the University of East London, England.

The fishery in some of the lakes in Ethiopia is quite intense, mainly by local people using small boats or rafts. Fish is an essential food, especially during the fasting season when people do not eat meat. Lake Chamo in the southern part of the valley is the most productive of the lakes. The Nile perch and tilapia together comprise the major fish catch. In December 2006, in connection with Girma's Ph.D. thesis defence in Addis Ababa, we had again an opportunity to visit several of the lakes (Chamo, Abaya, Awassa, Chitu, Langano, Ziway, Abijata and Koka). Undoubtedly, the water quality of several of these lakes has deteriorated since we first visited these lakes in 1994. Main serious threats to the lake ecosystems have come from soil erosion, extraction of water for irrigation, overfishing and pollution from the rapidly growing urban population and industry. Eutrophication resulting from nutrient enrichment was probably a less acute problem until very recently, but with sewer systems without efficient nutrient removal it is likely to increase. Blooms of potentially toxic cyanobacteria form a threat, and there are already reports about cattle deaths, e.g. at lakes Chamo and Koka. The effects of increased turbidity caused by resuspension of inorganic matter, which then leads to increased attenuation of underwater light and reduction of phytoplankton productivity, are most conspicuous in lakes Abaya, Langano and Ziway. Lake Chamo is likely to follow suit. The authorities have started taking measures to reduce erosion from farmlands but such measures may be inadequate to protect the lakes. Extraction of water for irrigation is rapidly increasing, especially in the Ziway area, to a great benefit for the farmers. The reduced water inflow to the lakes may, however, result in a lowering of water level, increased salinization and loss of surface area of these lakes. For example, the surface area of lake Abijata has already been reduced to almost half. Rapid expansion of flower plantations has also increased the stress on the water resources as well as the risk of pollution with pesticides.

As teachers and researchers, the Ethiopian limnologists have an important mission in their country. Protection and management of these highly vulnerable but precious aquatic ecosystems will need increased knowledge of their structure and functioning.

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Catch of Labeo horie at Lake Chamo, the southernmost lake in the Ethiopian Rift Valley. The commercially most important fish species in this lake are Nile perch and Nile tilapia. The fishermen use primitive rafts, as seen in the background, which give them little protection against attacks by crocodiles and hippos.

Book Reviews

Freshwater Fishes of North-eastern Australia

Pusey, Brad, Mark Kennard, and Angela H. Arthington. 2004. *Freshwater fishes of north-eastern Australia*. Collingwood, Vic: CSIRO.

This is a quite extraordinary book that covers an absolute mass of detail about the auto-ecology of the fish of northeastern Australia. It's huge, weighing 2.3 kg, so isn't the sort of thing you'd want to carry in the field (nor would you want to see it getting knocked around at $89, though its worth every cent). There is a very long key to all of the species, so there are helps for identification, though this is not one of its great strengths (the key might have been less daunting and easier to use if partitioned between families). Moreover, there are no colour photos so it's not the sort of book that you can sit down and rather idly browse through. But you will rarely find a book with this much detail and it is a splendid resource of information. It reminds me of one of the classics of fish literature, Bigelow & Schroeders Fish of the Gulf of Maine, first published in 1953. Around 130 species are explored, with a nearly standard set of sub-headings including: (1) description; (2) systematics; (3) distribution and abundance; (4) macro/meso/micro-habitats; (5) environmental tolerances; (6) reproduction; (7) movement; (8) trophic ecology; and (9) conservation status, threats and management. Each of these sections provides a substantial review of known information, much of it deriving from Pusey and his co-authors enduring and extensive surveys of the rivers/freshwater fish of Australia's northeast, covering from Queensland at its border with New South Wales in the south, to the Cape York Peninsula in the north, and then west to the Gulf of Carpentaria.

Their original work, in itself, on which this book is based, is monumental, and has taken the fish fauna of the area from being about the most inaccessible and little-known, to as well known as that in any other part of Australia. And, covering a huge transition from warm-temperate to sub-tropical, it provides a new perspective on Australian freshwater fish. You can only admire their long-term commitment to exploring some of the less accessible and little-known areas of Australia. Perhaps we should encourage them to do the same for the fish of another little-known area of northwestern Australia.

The species accounts vary a lot in size, depending of course on what is known about each, but some species run to 1416 pages of text printed in quite small, 9.5 font. There are lots of tables, graphs and pie charts summarising the data, but no distribution maps, which might have been useful but would have made the book even bigger. A series of large summary tables in an appendix does list the various catchments in which each species is found, though turning this into a visual impression of where they are found is not simple, perhaps easier for someone who knows the areas geography much better than I do. A fair bit of the information is derivative, and I have some concerns that the authors have derived their information from already derivative sources, so their text in some instances is a couple of steps away from the primary data. On the other hand the text is heavily referenced (nearly 1450 references). So, if you want to get back to the primary sources of data, this is often possible though not always, as some sources that are used are themselves already derivative and may not provide access to where the information came from originally (there is a slight danger here of being caught in a game of Chinese whispers). Often wanting to know the source of some interesting morsel of information, I found the use of reference numbers in the text, rather than authors and dates, a little irksome but at least the connections are provided, and comprehensively so. Pusey has produced a very large number of stipple drawings, done over many years, and knowing the work involved, I can imagine him spending long evenings, perhaps after a tiring day in the field, head down over a bit of Bristol Board, dotting away until the intensity of it almost makes you dizzy. The drawings are a little varied in quality but it would be churlish to be more critical, as they are mostly fine illustrations and will become the standard. I found it a little disconcerting that, in closely related species, some had scales drawn and others didn't, e.g., the two species of Gobiomorphus, but it has to be recognised that just producing these figures has been a very large and demanding task, and drawing scales is a rotten job. Also, one has to scan through the text to find out how big each fish illustrated is, and a caption would have been helpful. There are a few species missing, it seems. I looked for galaxiids (of course I did!), and found Galaxias maculatus mentioned in one of the tables but not dealt with in the text; also, Galaxias olidus reaches into southern Queensland, but is not mentioned at all. And a species of Stiphodon (f. Gobiidae) has been described from the area recently, but is not mentioned, and it is a particularly interesting record, as this genus is elsewhere virtually confined to oceanic islands of the tropics and sub-tropics. I find it a little frustrating that Australian fish biologists are content to have more than one common name for many of their fish, and this is true of the present book, as well as others of its kind. It seems to me time for the Australians to have a corroboree, and develop some consensus about what names to use and sooner rather than later. There is a brief chapter at the end called Conclusion: prospects, threats and information gaps, which is a sort of mop-up. I cannot escape the thought that Pusey and co-authors must have a lot yet to tell us about the community ecology of these little-known fish and rivers. Maybe another book? So, all in all, don't let a few quibbles detract from a wonderfully informative book that deserves to be widely purchased and used. It provides insights into the ichthyology and fish biology of Australia's northeast, will be an essential text on the fish of that area for decades, and it sets a standard for the rest of Australia (and places further a field) to aspire to.

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Republished from*: Journal of Marine and Freshwater Research, 2005, Vol. 39*: 11961197. 00288330/05/39051193 The Royal Society of New Zealand 2005

Long-term Environmental Change in Arctic and Antarctic Lakes Volume 8

Pienitz, R., Marianne S. V. Douglas, and J. P. Smol. 2004. *Long-term environmental change in Arctic and Antarctic lakes*. Developments in paleoenvironmental research, Vol. 8. Springer Dordrecht.

Concerns over the effects of global climate change have focused attention on the vulnerability of circumpolar regions. Long-term historical data are needed to better understand patterns of environmental change related to both natural and anthropogenic causes, as well as to assess patterns of natural

variability. The paucity of instrumental data requires that proxy methods be used. The abundance of lakes throughout the Arctic and Antarctic makes paleolimnological approaches especially powerful tools to assist interpretations of environmental change. This book provides a synthesis of the broad spectrum of techniques available for generating long-term environmental records from circumpolar lakes, in addition to providing overviews of the geographic extent of paleolimnological work completed thus far in these regions. It explores the diverse ways in which paleolimnology is used to address the pressing and emerging environmental issues of high-latitude regions. By providing both an introduction and in-depth reviews, this volume is of interest to students and advanced researchers alike who are studying Earth, atmospheric and environmental sciences.

Aims and Scope of Developments in Paleoenvironmental Research Series: Paleoenvironmental research continues to enjoy tremendous interest and progress in the scientific community. The overall aims and scope of the Developments in Paleoenvironmental Research book series is to capture this excitement and document these developments. Volumes related to any aspect of paleoenvironmental research, encompassing any time period, are within the scope of the series. For example, relevant topics include studies focused on terrestrial, peat land, lacustrine, riverine, estuarine, and marine systems, ice cores, cave deposits, palynology, isotopes, geochemistry, sedimentology, paleontology, etc. Methodological and taxonomic volumes relevant to paleoenvironmental research are also encouraged. The series will include edited volumes on a particular subject, geographic region, or time period, conference and workshop proceedings, as well as monographs. Prospective authors and/or editors should consult the series editors for more details. The series editors also welcome any comments or suggestions for future volumes.

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The Tilapia Trail - The Life Story of a Fish Biologist

McConnell, Ro. 2006. *The tilapia trail: the life story of a fish biologist*. Ascot [England]: MPM.

Ro McConnell was one of the early pioneers studying the ecology and evolution of the world's richest diversity of freshwater fishes in African lakes and South American rivers. One of the principal subjects of her research on cichlid fishes was into how tilapia, which evolved in African waters but are now such important food fish worldwide, lived in their original habitats. This book provides a relaxed and readable account not only of the enjoyment of exploring tropical waters but also of work on these fish and the African Great Lakes up to the present day. It is also a reminder of how both science and society have changed over the past sixty years, with the advent of new equipment and changed paradigms.

Profusely illustrated with black and white photographs (many of historical interest) throughout plus 16 pages of color photographs.

ISBN 0-9545596-4-9 Retail Price £20.00 plus £4 p&p. To order contact Mary Morris at p.morris5@btinternet.com

Working Group Activities

The SIL Working Group on Aquatic Birds

In 1989, at the XXIV SIL Congress in Munich Germany, a small group of the participants felt the need to treat waterbirds in a limnological context. An *ad hoc* Symposium, "Aquatic Birds in the Trophic Web of Lakes," was organized at Sackville, New Brunswick, Canada, in August 1991. The proceedings of this symposium were published in Hydrobiologia (1994, Volume. 279/280) and as Developments in Hydrobiology (1994, Volume 96). The outstanding success of this symposium led to the formation of SIL Working Group on Aquatic Birds in 1992 during the XXV SIL Congress in Barcelona, Spain.

The main objective of the Working Group on Aquatic Birds has had been to integrate waterbirds into hydrobiology and treat studies on these birds in a limnological context. To achieve this goal, the Working Group organizes triennial conferences to facilitate communications among limnologists interested in aquatic birds and ornithologists interested in the aquatic habitat.

The first conference of the SIL Working Group on Aquatic Birds was held in Sopron, Hungary, in November 1994, and its proceedings were published by Wetlands International (1997) as a Special Publication #43. The second conference was convened in Mérida, Mexico, in November 1997, with its proceedings published by Universidad Autonoma de Yucatan in 2000. The third conference took place in Trebon, Czech Republic in May 2000 with Abstracts published in Sylvia. The fourth conference was organized at Sackville, New Brunswick, Canada, in August 2003 (Developments in Hydrobiology, Volume, 189, reprinted from Hydrobiologia Volume 567), and the fifth conference "Limnology and Water Birds 2006" took place in Eger, Hungary, in August 2006. Preparations for the next conference in Edmonton, Alberta, Canada, in 2009 are now under way.

The majority of the participants (about 120) of these conferences are not limnologists, but they are required to present their work in a limnological context (e.g. give basic water quality features, use the OECD trophic classification). This provides an increasing number of papers dealing with the role that birds play in aquatic ecosystems. Thus, since the early nineties waterbirds found their well-deserved place in limnology textbooks, and many ecosystem studies.

The Working Group on Aquatic Birds also held workshops and lectures during the SIL congresses in São Paulo, Brazil (1995), Dublin, Ireland (1998), Melbourn, Australia (2001) and Lahti, Finland (2004). A special session *Waterbirds in the trophic web of inland waters* is planned for the Montreal congress in August 2007.

Joseph Kerekes
Chairman, Aquatic Birds Working Group

Announcements

Retirement of Professor Gene Likens

I thank Prof. Gene Likens for agreeing to contribute for the readers of SIL News the following article on the occasion of his retirement on 29 May 2007 as Director and President of the Institute of Ecosystem Studies (IES) in Millbrook, NY, USA. The good news is that Gene plans to 'return to full-time research'. On behalf of our readers and on my personal behalf I wish Gene a very fruitful and productive research period. Ramesh D. Gulati, Editor SIL NEWS

There will be some major changes at the Institute of Ecosystem Studies (IES) in Millbrook, NY, USA during the next several months. After founding the IES almost 24 years ago, I plan to step aside as Director and President on 29 May 2007 and return to full-time research. Leading the Institute has been a wonderful and productive experience for me, and I am extremely proud of what IES has become. Fortunately, I have also been able to maintain an active research program on Mirror Lake, stream ecosystems and watershed-ecosystems within the Hubbard Brook Valley in the White Mountains of New Hampshire during this time. Thus, I am planning for a relatively easy transition back to being a full-time research scientist at the Institute. I have a large number of research and writing projects that I plan to pursue during the next several years.

The Institute has become a strong center for ecological research (www.ecostudies.org), and has developed a major focus on limnological research and education, with Drs. Nina Caraco, Jonathan Cole, Stuart Findlay, Michael Pace, David Strayer and myself, as the core of this program. We have had active research programs on diverse topics such as the anthropogenic acidification and eutrophication of surface waters, invasive species, the biogeochemistry of carbon, food webs, the ecology of mussels including endangered species, salamander populations, aquatic ecosystem metabolism, ecology and biogeochemistry of stream ecosystems, paleolimnology, microbial ecology, and global river chemistry. We have trained a large number of postdoctoral associates, graduate students, and undergraduates over the past 24 years. Our research activities have also been supported by a dedicated and excellent group of research support specialists and technicians.

I anticipate that the pressing need for a better and more complete understanding of freshwater ecosystems will only grow in the future. I also anticipate that the Institute of Ecosystem Studies will remain a strong and active center for limnological research and education into the foreseeable future.

Gene E. Likens
President, SIL

Migration of SIL Archives

The archives of SIL have been housed until recently at Max-Planck Institute for Limnology in Plön, Germany. Winfried Lampert has been custodian of the archives. Winfried retired as Director of MPIL in September 2006, and a new director has been chosen. As is commonplace for Max-Planck institutes, the choice of a new director sets the research agenda for the institute. Reflecting the interests of its new director, Manfred Milinski, the Max-Planck Institute at Plön will now be specifically oriented toward evolutionary genetics. While there will continue to be some work on aquatic organisms, the institute will shift away from limnology.

Because the Max-Planck Institute at Plön will no longer be a limnology institute, it would be unreasonable to expect the archives to remain with the institute. With encouragement form Winfried Lampert, the SIL Executive Committee decided to find a permanent home for the SIL archives. It is now determined that the SIL Archives will be held in perpetuity at Norlin Library, University of Colorado, Boulder, CO USA. The custodian of the archives within Norlin Library is the archiving staff, headed by Professor Bruce Montgomery.

The archiving staff at CU Boulder is indexing the archives and preparing them for access

Upcoming Events

NABS 55th Annual Meeting
June 3-7, 2007
Columbia, South Carolina
http://www.benthos.org/Meeting/index.htm

Symposium for European Freshwater Sciences 5 (SEFS5)
8-13 July 2007
University of Palermo
Italian Association for Oceanology and Limnology, Freshwater Biological Association
http://www.sefs5.it

SIL2007 in Montréal
12-18 August 2007
Montréal Convention Centre
Group for Interuniversity Research in Limnology and Aquatic Environment, Societas Internationalis Limnologiae, and Society of Canadian Limnologists
http://www.uqam.ca/SIL2007

ASLO Summer Meeting
June 8-13, 2008
St. John's, Newfoundland
American Society for Limnology and Oceanogrpahy
http://aslo.org/stjohns2008/

Plant Litter Processing in Freshwaters (PLPF5)
23 - 26 July, 2008
University of Coimbra, Portugal
Coimbra University and IMAR (Instituto do Mar / Institute of Marine Research)
http://www.uc.pt/plpf5/

ASLO Aquatic Sciences Meeting
January 25-30, 2009
Nice, France
American Society for Limnology and Oceanogrpahy

by any interested party. The archives consist of 29 standard file boxes (about 10m of shelf space) extending in time from correspondence surrounding creation of SIL to recent times.

William M. Lewis, Jr.
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Seventh International Chrysophyte Symposium

We are pleased to announce that the Seventh International Chrysophyte Symposium will be held during the week of June 23, 2008 at Connecticut College, New London, Connecticut, U.S.A. The three to four day symposium is expected to bring together experts from around the world representing a broad spectrum of disciplines. Although the overriding theme of the symposium will focus on "chrysophytes" in a broad sense, we anticipate significant contributions representing allied heterokont groups and an infusion of ideas from other fields.

In addition to regular paper sessions, we are planning four mini-symposia: paleolimnology/paleobiology, taste and odor problems in drinking water, heterokont phylogeny and use of geometric-morphometric concepts in the study of algae. The symposium will include several keynote speakers who work in areas peripheral to chrysophyte biology, allowing for a cross fertilization of ideas. Our goal is to provide a forum to advance the study of chrysophytes. There will be a Proceedings volume published by Cramer under the Nova Hedwigia Beiheft series.

As has been the case in the previous six symposia, we will strive to have non-concurrent sessions and foster an environment that allows significant opportunities for people to interact in small groups. We also plan to take advantage of our local setting, including collecting opportunities in both freshwater and marine habitats, a traditional New England clambake and trips to Mystic Seaport (www.mysticseaport.org), Mystic Aquarium (www.mysticaquarium.org) and possibly a behind the scenes tour of the Peabody Museum at Yale University (www.yale.edu/peabody). In addition, tours of Pfizer's Global research facility (www.pfizer.com) may be possible.

The organizing committee consists of:

Peter Siver (Department of Botany, Connecticut College, U.S.A.)

Anne Lizarralde (Department of Botany, Connecticut College, U.S.A.)

Jim Wee (Department of Biological Sciences, Loyola University, U.S.A.)

Robert Andersen (Bigelow Laboratory for Ocean Sciences, U.S.A.)

Sue Watson (National Water Research Institute, Burlington, Canada)

Christian Kamenik (Institute of Plant Science, University of Bern, Switzerland)

Hwan SuYoon (University of Iowa, U.S.A.)

Since we are still in the planning stages of the symposium we welcome any and all ideas and suggestions. Please direct any comments, suggestions and special needs to Peter Siver via peter.siver@conncoll.edu with a copy to Anne Lizarralde via anne.lizarralde@conncoll.edu. All symposium information, including registration and abstract forms, will be posted on this website. If you would like to be included on the symposium mailing list in order to receive announcements please contact Anne Lizarralde at anne.lizarralde@conncoll.edu . We look forward to seeing all of you in 2008!

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Science News

No Sex for 40 Million Years? No Problem.

(Division of Biology, Imperial College London: News Release : New research shows that tiny asexual creatures (*bdelloid rotifers*) have managed to evolve into different species.)

A group of organisms that has never had sex in over 40 million years of existence has nevertheless managed to evolve into distinct species, says new research published today. The study challenges the assumption that sex is necessary for organisms to diversify and provides scientists with new insight into why species evolve in the first place.

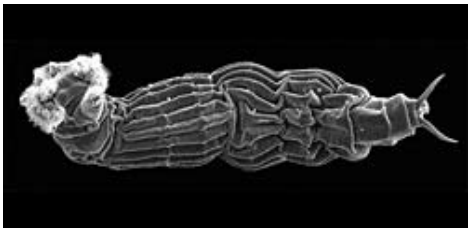
The research, published in *PLoS Biology,* focuses on the study of bdelloid rotifers, microscopic aquatic animals that live in watery or occasionally wet habitats including ponds, rivers, soils, and on mosses and lichens. These tiny asexual creatures multiply by producing eggs that are genetic clones of the mother – there are no males. Fossil records and molecular data show that bdelloid rotifers have been around for over 40 million years without sexually reproducing, and yet this new study has shown that they have evolved into distinct species.

Using a combination of DNA sequencing and jaw measurements taken using a scanning electron microscope, the research team examined bdelloid rotifers living in different aquatic environments across the UK, Italy and other parts of the world. They found genetic and jaw-shape evidence that the rotifers had evolved into distinct species by adapting to differences in their environment.

Dr Tim Barraclough from Imperial College London's Division of Biology explained, "We found evidence that different populations of these creatures have diverged into distinct species, not just because they become isolated in different places, but because of the differing selection pressures in different environments."

"One remarkable example is of two species living in close proximity on the body of another animal, a water louse. One lives around its legs, the other on its chest, yet they have diverged in body size and jaw shape to occupy these distinct ecological niches. Our results show that, over millions of years, natural selection has caused divergence into distinct entities equivalent to the species found in sexual organisms."

Previously, many scientists had thought that sexual reproduction was necessary for speciation because of the importance of interbreeding in explaining speciation in sexual organisms. Asexual creatures like the bdelloid rotifers were



The bdelloid rotifers, have confounded scientists by surviving for millions of years and evolving into distinct species despite being asexual creatures.

known not to be all identical, but it had been argued that the differences might arise solely through the chance build-up of random mutations that occur in the 'cloning' process when a new rotifer is born. The new study proves that these differences are not random and are the result of so-called 'divergent selection', a process well known to cause the origin of species in sexual organisms.

Dr Barraclough adds, "These really are amazing creatures, whose very existence calls into question scientific understanding, because it is generally thought that asexual creatures die out quickly, but these have been around for millions of years."

"Our proof that natural selection has driven their divergence into distinct species is another example of these miniscule creatures surprising scientists – and their ability to survive and adapt to change certainly raises interesting questions about our understanding of evolutionary processes."

Reference

Diego Fontaneto[1], Elisabeth A. Herniou[2,3], Chiara Boschetti[4], Manuela Caprioli[1], Giulio Melone[1], Claudia Ricci[1], Timothy G Barraclough.[2,3,5] "Independently evolving species in asexual bdelloid rotifers," *PLoS Biology,* Monday, 19 March 2007.

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For more information please contact Danielle Reeves, Imperial College London press office via e-mail at Danielle.reeves@imperial.ac.uk.

This news release is published in SIL News 50 with prior permission from Dr Timothy G. Barraclough, Division of Biology, Imperial College London, UK.

New Modeling Study Forecasts Disappearance of Existing Climate Zones

Reprinted from a March 27, 2007 National Science Foundation press release. For more information contact Cheryl Dybas, NSF (703) 292-7734, cdybas@nsf.gov or Jill Sakai, University of Wisconsin at Madison, (608) 262-7734, jasakai@wisc.edu.

Tropics and Subtropics May Develop New Climates

A new climate modeling study forecasts the complete disappearance of several existing climates in tropical highlands and regions near the poles, while large swaths of the tropics and subtropics may develop new climates unlike any seen today.

In general, the models show that existing climate zones will shift toward higher latitudes and higher elevations, squeezing out the climates at the extremes--tropical mountaintops and the poles--and leaving room for unfamiliar climes and new ecological niches around the equator.

The work, by researchers at the University of Wisconsin-Madison and the University of Wyoming, appears online in the journal Proceedings of the National Academy of Sciences (PNAS) during the week of March 26. The National Science Foundation (NSF) funded the research.

The most severely affected parts of the world span both heavily populated regions, including the southeastern United States, southeastern Asia, and parts of Africa, and known hotspots of biodiversity, such as the Amazonian rainforest and African and South American mountain ranges.

The patterns of change foreshadow significant impacts on ecosystems and conservation. "There is a close correspondence between disappearing climates and areas of biodiversity," says University of Wisconsin at Madison geographer Jack Williams, primary author of the paper, which could increase risk of extinction in the affected areas.

For example, the Andes, Central America, South Africa and the Indonesian Archipelago are all hotspots of biological diversity. The projected disappearance of the climates unique to these regions places some species at risk of extinction.

"As this research shows, studies integrating paleoclimate data, mathematical modeling and ecological principles provide insights into climate cause-and-effect that are of great practical consequence," says David Verardo, program director for paleoclimate at NSF,

Williams and his colleagues foresee the appearance of novel climate zones on up to 39 percent of the world's land surface area by 2100, if current rates of carbon dioxide and other greenhouse gas emissions continue, and the global disappearance of up to 48 percent of current land climates.

The underlying effect is clear, Williams says. "More carbon dioxide in the air means more risk of entirely new climates or climates disappearing."

In an effort to keep up with climate change, plant and animal species already have begun to move away from the equator and toward the colder climates of the poles. In mountain ecosystems, many lower-mountain species are moving higher--to cooler spots. What will happen when they "run out of room" on a mountainside?

The question becomes not just whether a given climate will still exist, but "will a species be able to keep up with its climatic zone?" Williams says.

The work was conducted in collaboration with Stephen Jackson at the University of Wyoming and John Kutzbach at the University of Wisconsin.

Working Groups of SIL and their Contact Persons as of May 2006

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Attention: Manufacturers of Limnological Equipment and Publishers

SILnews accepts advertisements for equipment and publications that will be of interest to SIL members.

SILnews is distributed three times a year to more than 3,000 members and libraries world-wide. If your company is interested in acquiring advertising space in *SILnews,* please contact the Editorial office for rates at richard.robarts@ec.gc.ca or use the mailing address indicated on the front page.

A complimentary copy of *SILnews,* in which your advertisement appears, will be sent to you once it has been published. *SILnews* is posted on the SIL web site at http://www.limnology.org after it has been published and your advertisement will appear there.

Limnology Job and Studentship Notices

Notices on the availability of limnologically-oriented jobs and graduate student opportunities are now accepted for publication in *SILnews* and displayed on the SIL web site at http://www.limnology.org. There is no charge for the service at this time, which is available to SIL members and non-members.

Persons submitting notices should note the four month lead-time for the print edition of *SILnews;* those advertisements with short deadlines should be directed to the web site only.

Submissions should include:

- a short title describing the position (job or studentship);
- location and duration of the position;
- closing date for applications;
- a short paragraph describing the position, including any citizenship, educational or employment prerequisites; and,
- information on where potential applicants may obtain further information, including names of contact persons, telephone numbers, fax numbers, e-mail addresses, and web site addresses, where appropriate.

Submissions may be edited for length and clarity. Those deemed inappropriate to the SIL mandate will be rejected at the discretion of the *SILnews* Editor or the Webmaster. Submissions for the print edition of *SILnews* should be sent to the editor at the address on the cover of this issue.

Submissions for the SIL web site should be sent by e-mail to webmaster@limnology.org or by fax to the attention of Gordon Goldsborough at: +1 (204) 474-7618.

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