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In This Issue

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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.

Editorial

As Editor of the *Silnews letter* for nearly six years, I thought that as I gain experience and the routine, the task of editing the newsletter would become easier. Nevertheless, filling this issue was a bit of a challenge. Thanks to Internet/email and general advancement in science, there is remarkable upsurge in opportunities or avenues to interact with the fellow aquatic scientists. Remarkably, simultaneous with these developments, the number of our SIL colleagues who want to contribute to the newsletters has started to dwindle. It is striking that many of the SIL Working Group leaders, who earlier used to approach me with their reports/announcements, without my asking them, are no longer there. Thus, for the both present newsletter and previous one, I approached the WG leaders collectively, and when that did not help, I sent them all individual requests to contribute to the newsletter about their WG activities, including meeting reports or announcements of any upcoming symposia. Fortunately, a few- though really a few- responded and for the rest it appeared as though my emails had landed in the SPAM folders. I do not have any grudge or grievance but want to give a vent to my sensitivities and concerns, or my *angst* as one would say in Dutch. On the other hand, I am relieved that I received substantial material to fill-up this winter issue of the newsletter.

To start with, following this editorial note, our president Brian Moss would like to share with us all his personal experiences, the hardships and rewards of his teaching a course in tropical ecology in the East Usambara mountainous area of Tanzania. Second, Brian has also good news for us all about the SIL and its financial balance but also concerning our journal *Inland Waters.* There is also good news for young limnologists. I will not disclose all but keep the suspense as I want you get all the good news directly from Brian's message to us all.

We have some sad news from Lisbon, Portugal, about the demise of Maria José Boavida a well known limnologist from Portugal on 30 August 2012 (see her obituary on subsequent pages). Her friends, students, and we all as SIL colleagues, will miss Zé (as she liked to be called) -even more so because she at one point was recovering from a long illness. Subsequent pages in the newsletter are devoted to various reports on regional developments in limnology in south Siberia (Russia) and Aral Sea (Kazakhstan) on saline lakes**,** India (revival of SIL WG Wetlands, etc.), Sri Lanka (guanotrophy), S. Africa (Cyanobacteria blooms) and Israel (ecosystem services in Lake Kinneret). There is also an announcement of a training course in zooplankton taxonomy in Mexico in 2013, elsewhere in this issue. There is also good news from the SIL WG *Plankton Ecology* (PEG). The PEG, which organized its Workshop *Global Warming and Plankton* (12-18 February 2012; see SILnews 60, pages, 6-7) in Mexico University, Mexico, decided to publish the proceedings of the meeting in *Inland Waters.* Thanks to the Editor-in-Chief, John R. Jones, who agreed to publish the proceedings as a Special Issue of the *Inland Waters*. A five-man editorial committee has been registered with the journal as guest editors. The manuscript submissions are now under way and the review process is just starting. The appearance of this Special Issue of *Inland Waters* is planned to synchronize with the 32nd Triennial Congress of the International Society of Limnology (SIL), from August 4th to 9th, 2013, in Budapest, Hungary.

Lastly, our summer issue in June next year will appear two months before the 32nd SIL Congress, and I hope that we can come back with more good news about the Congress programme and the WG activities that will take place in the coming months or are planned during the Meeting in Budapest.

Ramesh D. Gulati
Editor, SILnews

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With thanks to Prof. R.T. Heath for his kindness in sharing his thoughts about Zé.

Addendum to Obituary of Boavida

Zé, or Maria José Lemos Boavida, was known and loved in many places from Beira (Mozambique) where she was born, through Kent (Ohio) where she made her most meaningful discovery on *Daphnia* role in phosphatase production, to Lisbon (Portugal) where she had lived most of her academic life. She shared her life with many people in other places, though. I am only one of many whom Zé had made her friends for life. I met her first as Bob Heath's Ph.D. student at Kent State University (Ohio) in 1981. She became my guide in the world of Portuguese culture and Mozambican geography that led us thorough research projects on Zambezi, Cahora Bassa and Lake Niassa during1982-83. A few years later, she joined us for a field course on aquatic ecology on the shores of Lake Mikolajskie (Poland). In 1993, I joined her in Lisbon as a Gulbenkian fellow, and we made an intense study on zooplankton and fish of lakes of Estrela Mountains: our

Zé Boavida (second from right) with me and two other Polish friends flanking us at one of experimental lakes, Mazurian Lake District, Poland, July 1995

joint paper on the contrasting effects of cyclopoid and fish predation on *Daphnia* clutch size fetching 28 citations to date . We also submitted a joint proposal for research work to the European Commission, which was funded. Zé joined our group in 1995-97 for exacting field studies on the possibility of mediating the effect of planktivorous fish on water quality in lakes by large doses of alarm substance to scare fish away from their zooplankton prey. She mastered some Polish words, but we all preferred her flexibility of often switching between Portuguese, English and French. We shall miss Zé greatly. I am sure others will miss her as much in other places in Africa, North America and Europe, perhaps on other continents as well.

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Reports

Twentieth anniversary (1992-2012) of the construction of the first earthen dike in the Berg's strait of the Aral Sea (Kazakhstan)

Due to morphology of Aral Sea depression there have always been two water basins - the Small Aral Sea in the north and the Large Aral Sea in the south. The Small Aral Sea was separated from the large one by Kokaral Island lying east-west. On the west side both the water basins were connected by shallow strait Auzykokaral and on the east they were connected by relatively deeper Berg's strait (maximum depth 13 m). The first one dried up already in 1968, and the second one in 1989-1990 when the water level dropped by about 13 m, reaching ca. +40 m a.s.l., and separating the Small Aral from the Large Aral Sea.

After separation, the water level continued to decrease only in the Large Aral. In the Small Sea, contrary to the Large Sea, the relatively higher water level was caused by evaporation of water that was lower than water income. This level increase resulted in water overflow to the Large Aral via the channel along the dried area of Berg's strait. As difference in levels of Small and Large Aral Sea increased, the stream velocity gradually increased, causing the channel bottom erosion and increasing in depth and length. Discharge of water from Small Aral

Dike and water spillway under construction, August 24, 2005 (Photo by E. Putnam)

occurs primarily in spring and early summer high flow period on Syr Dar'ya (Aladin et al., 1995).

Because the bottom sediment in the former Berg's strait is loose, there was a danger that the channel would deepen and result in the water level in the Small Aral to decrease again. Moreover, after

*Table 1. Hydrological and Salinity Characteristics of the Aral Sea, 1960–2009 (*Source: *Micklin, Philip (2010). "The past, present, and future of? Aral Sea." Lakes & Reservoirs: Research and Management, 15,*

Year and portion of sea	Level (m asl)	Area (km2)	% 1960 area	Volume (km3)	% 1960 volume	Avg. salinity (g/l)	% 1960 salinity
1960 (Whole)[a]	53.4	67,499	100	1,089	100	10	100
Large	53.4	61,381	100	1,007	100	10	100
Small	53.4	6,118	100	82	100	10	100
1971 (Whole)	51.1	60,200	89	925	85	12	120
1976 (Whole)	48.3	55,700	83	763	70	14	140
1989 (Whole)		39,734	59	364	33		
Large	39.1	36,930	60	341	34	30	300
Small	40.2	2,804	46	23	28	30	300
Sept. 2009 (Whole)		8,409,	12.5	84	7.7		
W. Basin Large	26.5	3,702	27	56		>100	>1000
E. Basin Large	26.5	857	1.8	0.64		>200?	>2000
Small	42	3,487	57	27		14-Oct	100-140
Tshchebas Gulf	28	363		0.51		>100	>1000

Completed dike and water spillway view from tailrace, September 23, 2007 (Photo by I. Plotnikov)

Completed dike and water spillway view from the Small Aral, September 23, 2007(Photo by I. Plotnikov)

some time this self-deepening channel could approach the Syr Dar'ya mouth and so divert most or all of its flow into the Large Aral. Thus, there could be a danger of not only rapid fall in water level of the Small Aral but of its disappearance (Aladin et al., 1995).

In 1991, one of us (N. Aladin) reported to local authorities about this imminent danger. In May 1992 N. Aladin suggested to the head of Aral district administration Bigali Kayupov to build a dam in the former Berg's straits in order to maintain water in the Small Sea. The District Administration together with N. Aladin reported this to the head of administration of Kyzylorda region: the Seilbek Shauhamanov. After discussions, the idea was accepted and the government of Kazakhstan decided to construct a dike in Berg's strait. The channel was dammed in August 1992 (Aladin et al., 1995).

The dike was built from sand and reed fascines. However, the dike was very fragile and sensitive to wave action and had no mechanism to discharge excess water. In April 1993 when the level of the Small Aral rose >1 m the dike was partly damaged (Aladin et al., 1995). New head of Aral district administration Alashpay Baimyrzaev continued to reinforce the dike. Finally a dike across the whole width of Berg's strait of about 13 km long and 4 m high was built. Every year until 1999, this earthen dike was broken during spring floods, but immediately after that it was repaired again.

Anyway the water level could be maintained at about +42 m a.s.l. Salinity could be maintained at <20g/l. Conservation of the Small Sea allowed fishing activities and a partial restoration of the Syr Dar'ya delta ecosystem. The danger that the artificial channel connecting the Small and Large Aral seas would cut down and drain the Small Sea completely and divert the flow of Syr Dar'ya into the Large Sea was temporarily eliminated (Aladin et al., 1995). However, because of a storm on April 20, 1999 waves destroyed the dike (Micklin, Aladin, 2008). After this catastrophe the dike was not repaired. A. Baimyrzaev was removed from his duties and the next head of Aral district administration Aitbay Kusherbaev got an order to build a proper concrete dike with a gated spillway.

The *water resources committee* of the Ministry of Agriculture of Kazakhstan headed the project. In addition to the US$ 62 [64?] million provided by World Bank, US$21.3 was made available by the Kazakh Government. World Bank granted 9 con-

tracts, the most important of these going to the China-Geoengineering (US$16.6 M) and Russian Zarubezhvodstroy (US$27.8), which won the tender. In October 2003 preparation works were in process, and construction itself was to begin in spring 2004. Water retention began in the autumn of 2005 and by March of the next year the water level had increased to +42 m a.s.l. (Micklin, Aladin, 2008; Aladin et al., 2008, 2009). All the time till now, the water of Small Aral Sea is relatively stable with a maximum fluctuation of one half meter (41.5 m to 42.5 m) around the design height of 42 m. Average salinity was decreasing and reached less than 10 g/l. Freshening of the water allowed the aboriginal commercial freshwater fishes returning to the Small Aral Sea from the lacustrine system of lower Syr Dar'ya (Micklin, Aladin, 2008).

The hydro system of Northern Aral Sea Dam includes the dam itself with spillway, supply and tailrace canals and an access road. The dam is constructed of sandy soil mixed with limestone rocks; its length in the ridge is 13 km, average height is 4 m and width in the ridge is 10 m. The spillway is designed as a broad-crested overflow with a 5m deep pool. Total crest width is 49.5 m. This new dike in Berg's strait allows increase of level in Small Aral Sea to +42 m a.s.l. and steady decrease of average salinity. This has allowed improving brackish water environment of this residual water body of the Aral Sea.

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Siberian scientists launched an interdisciplinary research cooperation project to study the stability of meromictic lakes

Most deep lakes in temperate and subtemperate regions stratify during summer, i.e., the water column separates into distinct layers of different density. As the air temperature falls during autumn, winds mix the lake and the temperature differences and density gradient disappear. In spring, winds can also mix the lake completely so that there is a complete homogeneity of temperature from lake surface to bottom. In salt lakes, however, mixing can be impeded by the non-uniform distribution of the salinity, with usually relatively higher density of the deeper waters. There are many lakes in which the density of the bottom, more saline layer of water, is higher than that of the upper, less saline layers and, thus, these layers with varying salinities do not mix. These lakes are referred to as meromictic (Boehrer and Schultze 2008).

What is so interesting about the meromictic saline lakes? The bottom layer of the lake, which is not involved in the autumnal or spring turnover, becomes anoxic and may persist in this state for decades. The metabolic activities of bacteria in these deeper, anoxic layers result in accumulation of hydrogen sulfide (H_2S). Unusual bacterial communities develop at the lower boundary of the upper layer, containing dissolved oxygen, and the lower layer, which is anoxic. The amount of organic matter produced by oxic and anoxic bacteria in this transitional zone can be comparable with the amount of organic matter photosynthetically produced in the oxygen-containing layer. The non-mixing bottom layer of water – the monimolimnion – serves as

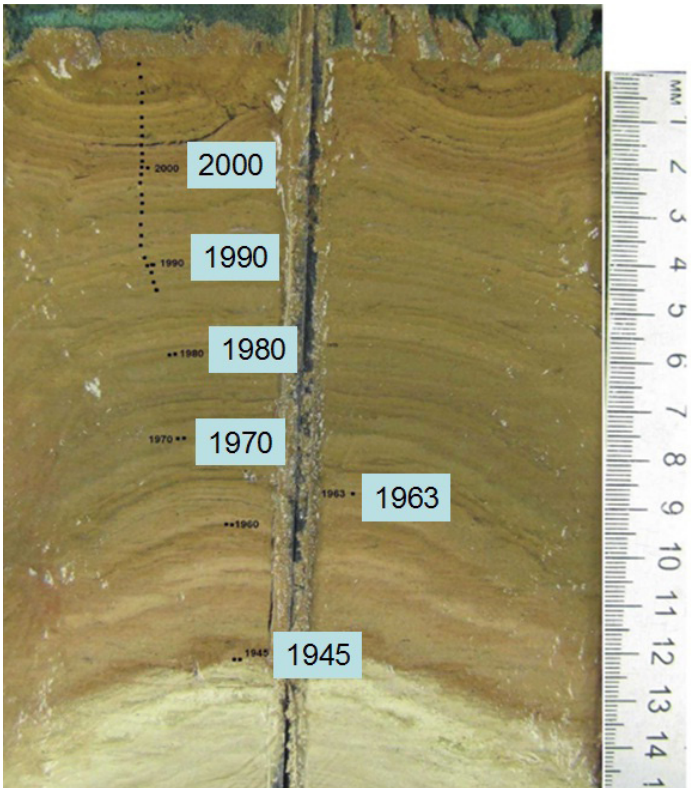

Fig. 1. The upper part of the sediment core from the bottom of Lake Shira. Date of 65 years was placed by 137Cs dating and varve counting. Data on age-depth model for Lake Shira sediments for 2500 years including radiocarbon analyses are presented in (Kalugin et al. 2012). Photo is kindly provided by Dr. Ivan Kalugin from the Institute of Geology and Mineralogy SB RAS (Novosibirsk)