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Three salty wishes

The articles of this issue all express, somehow, wishes related to salt heritage. The first offers the first part of a passionate tale of professor Nikolai Aladin's quest to save the northern Aral sea. The second article explains the results of a more modest, but successful action to recover two salinas in Murcia, SE Spain. Finally, the last article expresses the desire to coordinate efforts to safeguard salt heritage at global level, via the UNESCO's World Heritage programme. We also offer the usual sections of our journal. If the wait between issues of El Alfolí get too long, you can now follow us on twitter (@ipaisalorg) and facebook (www.facebook.com/ipaisal.org). We hope you enjoy reading us and we would like to invite you to contribute with your work.

Tres deseos salineros

Los artículos de este número expresan, de alguna manera, deseos relacionados con el patrimonio de la sal. El primero ofrece la primera parte de un apasionado relato sobre la lucha del profesor Nikolai Aladin para salvar el mar de Aral septentrional. El segundo artículo explica los resultados de un proyecto más modesto, pero exitoso, en el que se recuperan dos salinas de Murcia. Finalmente, el último artículo expresa el deseo de coordinar esfuerzos para salvaguardar el patrimonio salinero a escala mundial, mediante el programa de Patrimonio de la Humanidad de UNESCO. También ofrecemos las secciones habituales de la revista. Si la espera entre los números de El alfolí se hace muy larga, ahora nos puede seguir en twitter (@ipaisalorg) y facebook (www.facebook.com/ipaisal.org). Esperamos que disfruten de la lectura y les invitamos de nuevo a contribuir con sus trabajos.

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The dam of life or dam lifelong. The Aral Sea and the construction of the dam in Berg Strait. Part one (1988-1992)

Nikolai Aladin

Zoological Institute of the Russian Academy of Sciences, Saint-Petersburg

This article describes in detail the personal and professional quest of professor Aladin to study and protect the Aral Sea and describes the problems related to the construction of the dam in Berg Strait that should save it. This is the first part of a fascinating journey into the geopolitics of the Aral (red.).

Year 1988

In early 1988 Moscow writer Yury Chernichenko appeared in the telecast “Rural Hour” by USSR Central TV. He for the first time in the history of Soviet perestroika unexpurgatedly told mass viewers about the Aral Sea death.



Fig. 1: View of the Small Aral sea basin, with an abandoned ship in the foreground ©I. Aladin

My older friend and colleague Prof. Dr. Lev Aleksandrovich Kuznetsov and I after the telecast together wrote him a letter. In this letter to the Central TV we both gave our scientific data on the catastrophic changes in the Aral Sea and its shores. In the letter written by me I, for

the first time dealing with a non-professional, spoke about the possibility of trying to save the tenth part of the Aral Sea using the dam in Berg Strait.

Yuri Dmitrievich quickly responded to us and in his reply said that his colleague writers in Moscow are preparing an expedition to this popular perishing sea-lake and that he would inform these writers as to our names and addresses.

When Sergei Pavlovich Zalygin and Grigory Ivanovich Reznitchenko for the first time invited Lev Alexandrovich and me to work as scientific advisors in the scientific and journalistic expedition “Aral-88” I immediately at preparatory events in Moscow in June 1988 said to Moscow writers that the Small Aral Sea is separated from the Large Aral Sea and that there is an urgent need to put a dam in the Berg Strait, otherwise the Syr Darya will turn into the Large Aral and the Small Aral Sea will dry completely.

After meeting with these two writers and the leaders of the forthcoming expedition “Aral-88” in the main editorial office of Moscow literary monthly “Noviy mir” I went to another district of Moscow to the Presidium of Academy of Sciences of the USSR. There I met with the chairman of the Commission of Academy of Sciences of the USSR on Youth Yuri Petrovich Petrov and filed an application for the establishment of a laboratory for the study of brackish water hydrobiology first of all of Aral. In this my merely scientific application I also discussed the urgent need to build a dam in the Berg Strait.



Fig. 2: Map of the Amu Darya (left) and the Syr Darya (right) watersheds, feeding respectively the Large Aral sea, a.k.a South Aral and the Small Aral sea, a.k.a. North Aral

After mission to Moscow in early July 1988 I traditionally went to the Aral expedition where I worked with my friends Zaualkhan Kenzhegalievich Ermahanov and Nikolai Igorevich Andreyev from Aral Branch of KazNIRH. In this regular joint field trip we visited using KazNIRH's motor boat the whole Small Aral and saw with our own eyes and with our devices documented that in Berg Strait remained only a narrow canal through which water from the north (Small Aral) flows south into the Large Aral.

After trip to Kazakhstan I flew to the USA to give at the International Congress a talk on osmoregulation in crustaceans and how we can try to save the Aral Sea. Working at Louisiana State University in Baton Rouge I read at the local library everything that was written in the USA about the Aral Sea and found in the scientific journal "Science" the announcement of very fresh paper on the Aral topic authored by Prof. Dr. Philip Micklin (Micklin, P.P. 1988 . Desiccation of the Aral Sea: A water management disaster in the Soviet Union. *Science* 241: 1170-76). Working in the USA I also

became acquainted with Prof. Dr. Thomas Dietz who was interested in not only my data on osmoregulation in crustaceans but the idea to build a dam in the Berg Strait.

Directly from the USA I flew to Kazakhstan where at the beginning of August in the city of Aral'sk I met with part of the members of expedition "Aral-88". From Aral'sk we went by cars to Yanykurgan where all participants came together in a day and moved to Kyzylorda for an important meeting that was honored by the presence of Chingiz Terikulovich Aitmatov who came on purpose to the ancient capital of Kazakhstan. After all the meetings I was able to talk in detail about the idea of the dam with the great Kyrgyz writer who right away supported this idea and immediately introduced me to the Kazakh writer Mukhtar Shakhonov and asked him to help me in arranging the construction of dam in the Berg Strait.

From Kyzylorda through the desert we went on nearly impassable roads to Karakalpakstan and constantly discussed division of the Aral Sea into two sisterly water bodies – Small and Large Aral.

By the time our expedition from Muynak and the Amu Darya delta reached Nukus, the capital of Karakalpakstan, our central newspaper “Pravda” had published resolution No. 1110 of the Central Committee of the Communist Party of the Soviet Union on the Aral Sea. Participants of the expedition discussed this decision with the first secretary of the Karakalpakstan regional party committee Kakimbek Salykovich Salykov and he, too, as an ethnic Kazakh, immediately understood the menace of the Small Aral Sea drying and looking me in the eye said that he would help me to build a dam in the Berg Strait.



Fig. 3: View of the Aral Sea in 1988 (left) and 2008 (right). The Berg strait dam, located in the upper right corner, separates the so called Small Aral and the Large Aral seas.

Taking into account the importance of the fact of the Aral Sea separation into two water bodies – Small and Large Aral, Grigory Ivanovich Reznitchenko organized a special flight of our expedition members by several AN-2 airplanes over the shallow canal into which Berg Strait had turned, and many photographs and even filming of this sad event were made. Arriving on the island Barsakelmes everyone except me was shocked to see into what the strait had turned.

The strait previously exceeded 12 kilometers at the narrowest point. The famous writer Vasily Illarionovich Seliunin, who had already landed on the island told me once that even to him, a layman, it is clear as day that without the dam the Small Aral Sea has no future. He also told me that he will help to build this, by his words, DAM OF LIFE. He told me – “The people of Leningrad during war have built the ROAD OF LIFE on Ladoga Lake, now in peacetime let them try to build DAM OF LIFE on the Aral!!!”

After successful completion of scientific and journalistic expedition “Aral-88” at the Moscow House of Writers' Union the final meeting was held. In the materials of the expedition prepared for publication it said that the Aral Sea has divided into two unequal parts and that for the saving of the Small Aral one must urgently build a dam in Berg Strait.

On New Year's eve of 1989 I wrote from Leningrad to the USA to Prof. Dr. Philip Micklin a letter, in which I said that I read the announcement of his paper in the scientific journal “Science” and asked him to send me a reprint. I also wrote to colleague from the United States that I have some ideas how to save the Aral Sea and waited for his response. Prof. Dr. Philip Micklin responded by sending me reprint of the article by mail and letters by fax in which he told me that he also has a similar idea of a large dam in the Berg Strait and spillway in the former Strait Auzy Kok-Aral on the western tip of Kok-Aral island. Later Prof. Dr. Philip Micklin even suggested to divert part of Emba river flow to the Aral Sea via a specially dug canal.

Year 1989

In late January 1989, I learned that the head of UNEP the Egyptian Mustafa Tolba was going to meet with Mikhail Gorbachev and to invite him to launch a special diagnostic project on the Aral Sea under the flag of UNEP. I understood

immediately that it was a good chance to put the question on the construction of a dam in the Berg Strait and appealed to the Centre for International projects (CIP) in Moscow which was designated as the agency to work with Mr. M. Tolba to develop the initiative.

My request to the CIP was replied to by Deputy Director Nikolai Nikolaevich Litvinov. He invited me to join these UNEP project experts from our country (at that time USSR). Getting started in this project was very fast and even chaotic, but order in the project was quickly restored by Minister of Ecology and Natural Resources Nikolai Nikolaevich Vorontsov. He often came to visit our Institute Director (academician Orest Alexandrovich Scarlato) and during one of these visits I told our Minister about the idea to build a dam in the Berg Strait. This idea pleased N.N. Vorontsov because it would give fast and visible positive results and he asked me to report him regularly via my Institute director about promotion of this idea.

In February 1989 a letter came to me from Australia where Prof. Dr. William Williams offered to me to become a co-director of the 3rd. International Consortium for Salt Lake Research, and in the case of my consent he instructed me to oversee all salt lakes of Europe, Central Asia and Kazakhstan. I accepted the invitation to join the consortium and invited the Australian to go with me to the Aral Sea. William said that at the beginning of May 1989 he is ready to go to the Aral Sea. When we arrived to the Aral Sea then we flew to Barsakelmes by AN-2 airplane, and I as usual asked the pilots to fly over the shallowed Berg Strait to show from the airplane to Prof. W. Williams the place for possible construction of the dam.

The Australian professor, seeing the situation from the air, became passionately inspired by the idea of the dam and like all my colleagues and

partners he promised his help in the realization of its construction.

We returned with William from Aral expedition to Leningrad through Moscow where I presented Prof. W. Williams to the leadership of CIP. Soviet leaders of the project also offered William to join the project as an UNEP project expert from Australia.

In summer-autumn CIP organized the first trip of UNEP experts to the Aral. In this trip I met many wonderful scientists from various countries, who like William and me were appointed international UNEP experts. Of the entire galaxy of remarkable scientists I mention here only two – Prof. Dr. Tatu Kira from Japan and Prof. Dr. Gilbert White from USA. These two great explorers very warmly supported the idea of the dam, although the dam in the Berg Strait seemed to them both to be only a temporary measure because they believed that the Soviet Union will be able to quickly implement a program to reduce irretrievable losses of irrigation water in the Aral Sea region. They both very much believed in the power of the USSR and in our ability to save the Aral Sea as a whole.



Fig. 4: Another view of a stranded ship in Small Aral
©I. Aladin

In autumn in Tashkent our team of UNEP experts under the flag of CIP met with a team of journalists and photographers of the American magazine National Geographic. Philip Micklin served as a scientific consultant for this world famous magazine.

As I wrote above, this scientist sent to me in late 1988 a letter to which I replied immediately by fax, and we started corresponding. So in the Uzbekistan capital after years of correspondence and exchange of faxes and letters I first met my American colleague and for the first time was able to shake his hand.

I told the American magazine about the idea of dam construction, but they, like Professor Tatuo Kira and Gilbert White, considered it only a temporary measure and did not write about the idea of its construction in the magazine and were interested only in the results of my research on the crustaceans of the Aral. Therefore, in February of the year in their own paper they quote me only as a researcher of the Aral Sea fauna and did not write about the idea of building a dam.

At the end of September 1989 there was another important meeting in at that time Czechoslovakia. During international symposium in this country I met with Prof. Dr. Moshe Gofen from Israel. This researcher, having heard my report on crustaceans, spoke in the debate and supported the idea of building a dam in the Berg Strait.

Back in Leningrad I learned from my Institute director that my application for the establishment of the Laboratory of brackish hydrobiology for the studying primarily Aral has won in the open competition on November 16 and that I urgently needed to recruit employees. End of the year finished with a pleasant solution

of problems related to staff and equipment. By the beginning of December new members were added to the staff of Zoological Institute and just before New Year we began to plan field season for the upcoming 1990.



Fig. 5: The author, in one of his expeditions to Aral ©I. Aladin

Year 1990

Beginning of 1990 passed in efforts on Laboratory arrangement. Our young research team was one of the first to begin using computers in our daily work, both in the scientific and technical. In our Institute PC was exotic to us.

Our German colleague Dr. Dietmar Keyser suddenly contacted us in early spring about our idea of building a dam in the Berg Strait. He asked me to come to Hamburg University and talk not only about the Aral Sea crustaceans, but also about the idea of building a dam in the Berg Strait. The visit took place and I invited Dietmar to make a return visit to Leningrad that summer and then go together with us to Aral using the funds I received from the Academy of Sciences of the USSR in the competition of projects of young scientists.

In summer 1990 there was the first large International Conference on the Aral Sea. We tried to hold it in Moscow, but this conference was constantly canceled. Then Moscow writer Grigory Ivanovich Reznitchenko with immigrant from the Soviet Union to the United States Yuri Bregel agreed to hold it at the University of Indiana in Bloomington. The conference was good, but I was asked to talk only about reducing the number of aquatic animals in the Aral Sea but not relate to the idea of building a dam in the Berg Strait. American organizers bluntly told me that the conference participants from Uzbek SSR do not like the dam and that I must not by my report to provoke heated debate. Of course I was very upset but Grigory Ivanovich Reznitchenko asked me not to go against the will of the American organizers of this conference.

In the same year it was carried out our biggest expedition under the flag of the Zoological Institute of Academy of Sciences of the USSR. Besides 7 scientists of our laboratory I invited to the expedition two diving experts from Leningrad Institute of bridges and footings: Valeriy Semenovitch Kagan and Sergei Vasilyevitch Apraksin. I immediately talked these two researchers about the idea of our dam and they promised to measure with their instruments physical parameters of the canal formed in the Berg Strait as well as provide diving works, manage small boats and expedition vehicle. In addition, to the railway station Aral Sea our expeditionary cargo and equipment came in a special carriage of this Institute and expeditionary transport came on extra platform. Colleague from Moscow zoologist Dr. Nikolai Mikhailovich Korovchinsky was invited to the expedition. Besides this scientist from Moscow another Russian scientist Eduard Gerasimovich Dobrynin from Institute of Biology of Inland Waters of Academy of Sciences of the USSR in the village of Borok, Yaroslavl Region was

invited. There were foreigners: two our colleagues from the USA Prof. Dr. Philip Micklin and Prof. Dr. Thomas Dietz, colleague from Spane Miguel Alonzo and German colleague Dr. Dietmar Keyser.

This expedition began and was going very successfully but due to the case of bubonic plague in Aralsk and quarantine we have not got on the canal in the Berg Strait, and such studies had to be postponed to the next year.



Fig. 6: Winter expedition to Small Aral ©I. Aladin

Because of the plague and quarantine all of us had to hire AN-2 airplane and fly from the northern shore of the Aral Sea to the southern one. There we joined the working group of UNEP which carried out regular field trip and prepared the first version of the Diagnostic document. Met our colleagues from UNEP I began to ask them again to give me opportunity to write a chapter in this document about the possibility to build a dam in the Berg Strait but I was asked to write only a small supplement to the chapter on the possible scenarios of saving the Aral Sea.

Prof. Dr. Tatu Kira after my numerous letters and faxes to him gradually became more open to the idea of building a dam.

He, having been in the field trip to the Aral Sea, has understood the depth of the problem and asked my colleague Prof. Dr. Saburo Matsui invite me to come to the central office of ILEC to start study the idea of this construction. In autumn, after the expedition to the Aral Sea, such a visit to Japan took place and since then my scientific life is inseparably linked with ILEC. After my short work in Japan the idea of the dam besides Prof. Dr. Tatu Kira and Prof. Dr. Saburo Matsui was supported by Prof. Dr. Nakayama Mikiyasu and Prof. Dr. Masahisa Nakamura.

Year 1990 with a very good funding from the Academy of Sciences of the USSR went down into history. This year I could cover not only the cost of the expedition but could even make small payments of money allowances to all participants including foreigners. Taking into consideration financial well-being in 1990, for 1991 large plan of work in expeditions was laid down.

Year 1991

However, beginning of year 1991 was deafening and passed in the efforts to obtain money for our young Laboratory. In January our research team has been officially warned by the Presidium of the USSR Academy of Sciences that the promised money for the project will not come and that we should rely only on ourselves.

We needed new equipment and new expeditions, but USSR Academy of Sciences has started to collapse together with the Soviet Union. Solution was suggested by Prof. Dr. Lev Kuznetsov who was at that time the USSR People's Deputy. He invited me to talk at the World Conference on salt lakes in Bolivia. This talk took place in spring 1991 and again I was talking about the expediency of building a dam in the Berg Strait.

This idea of the dam was supported by many participants of this conference in South America. I would like to note the support of Israeli scientist Prof. Dr. Ari Nissebaum and scientist from Canada Prof. Dr. Theodore Hammer. These two very well-known scientists have been actively helping me promote the idea of the need to build a dam in the Berg Strait. At this conference many participants were from Spain or Spanish-speaking. These emotional people were discussing not only our scientific data but our expedition pictures and they promised to send us contacts with TV men from Spain.

Unexpectedly the idea of dam was supported by Soviet Ambassador in Bolivia Tahir Byashimovich Durdyev. During the conference it was necessary to vote for the preservation of the USSR and I went along with Lev Aleksandrovich Kuznetsov to our Soviet Embassy in the Bolivian capital La Paz to vote. After voting the ambassador invited us to supper and we take a closer look. Our ambassador in his youth was the first secretary of Komsomol of Turkmenistan and for this reason he was anxious about Aral wholeheartedly. So suddenly I had from Supreme Soviet diplomatic circles another supporter of the dam in the Berg Strait.

When we were back from Bolivia to the USSR has occurred Pavlov's reform and all the money including personal savings devalued. How to buy scientific equipment and additional computers and how to go to expedition I did not know and the Presidium of the USSR Academy of Sciences did not know too.

However, after the conference the head of Spanish TV company from Barcelona Mr. Alex Molina sent a fax to our laboratory in which, referring to the past in Bolivia conference, offered to make a film about the Aral Sea.

For this he promised to take part of the cost of the expedition to the Aral Sea himself and purchase a number of scientific instruments or buy a personal computer.

In summer of 1991 this expedition to the Aral Sea with TV men took place but to work on the canal in the Berg Strait we failed again. Last year it was prevented by plague and this year by the local KGB. All the time we worked only on the island Barsakelmes and only once it was able to fly a little by AN-2 in the vicinity of Bugun village and collect few samples on the Small Aral near this village. As it turned out later (in autumn 1991) attached to our expedition “specialist on tractors” Seisen Sultanovich Mauzhanov was actually captain of local KGB. After returning from the Aral expedition three Spanish TV man gave computer to our lab and so in our scientific team was by one PC more.

Besides three Spaniards from the Spanish TV company, for the second time on Barsakelmes worked with us on the Aral Prof. Dr. Dietmar Keyser from Germany and young scientist Ian Boomer from England. Like last year, all diving operations and management of motorboats did Valeriy Semenovich Kagan and Sergei Vasilyevich Apraksin.

After the expedition to the Aral I went to Australia to Prof. Dr. William Williams as well as to the Conference on ostracod crustaceans. It was a very useful trip because this continent is abundant with salt lakes. My colleague Prof. Dr. W. Williams was able to demonstrate to me almost all the methods of conservation and sustainable use of salt lakes. It was unusual to see how without any intervention of the Central Australian authorities local farmers themselves “manage” level and salinity of surrounding salt lakes. It was then from Prof. Dr. W. Williams I heard about the management of salt lakes and that the University of Adelaide holds special

workshops for Australian farmers on this topic. At the same time Bill showed me whole pocket library of thin booklets. Reading them farmer can begin to manage surrounding him lakes. Among these booklets there was very brief manual how to build and repair dams on salt lakes. Prof. Dr. William Williams even showed me inscription above his writing-table: “Evaporation from the surface of salt lake can be reduced only by dam which will cut superfluous evaporative surface area”. That’s how easy and simple it was in Australia.

As soon as I have returned to Leningrad from Australia, so-called coup occurred in the USSR and everything got worse. Immediately after these events we had not money at all again but in the early autumn we with no foreigners and no divers for the second time this year went to the Aral Sea.



Fig. 7: Collecting samples from the frozen Small Aral
©I. Aladin

The first who came in Aralsk to see off us to the expedition in September 1991 was “expert on tractors” Seisen Sultanovich Mauzhanov. He told me that he was actually the captain of the local KGB while he sincerely added that he relates to us and to our all foreigners well and that we are doing the right thing and that we have this time be allowed to collect samples in the canal on the place of Berg Strait.

Unfortunately, we were able to use this permission from the local former KGB (now the service here was called KNB – Kazakh National Security) only after six months in May 1992 because without motorboats, hydrological current meter and other specialized equipment to go to the canal in September and October 1991 was unreasonable.

In early winter the USSR collapsed. When this happened my colleague Associate Professor Dmitry Olegovich Eliseev and I were in Pakistan at the conference on salt lakes. My colleague reported about the Aral Sea birds and I as always about the inhabitants of the Aral Sea waters of course about the need to build a dam in the Berg Strait.

As soon as in Karachi became known that Mikhail Gorbachev signed a decree abolishing the Soviet Union, local police came to the hotel and wanted to arrest me and my colleague Eliseev because our visas of Soviet citizens were in the new geopolitical situation not valid. But met our strong protest the police just have photographed us in front and profile (at our expense). Police issued ultimatum demanded that we pay these costs and friendly advised go home to Russia sooner. The next morning we got to know from local newspaper that Pakistan was the first country in the world to recognize the new Russia – Main Splinter of the USSR. In the local newspaper article it was written that

Russia – Main Splinter of the USSR is recognized by Islamabad. For this reason we both flew from Karachi International Airport without visa problems.



Fig. 8: Ships in small Aral ©I. Aladin

Year 1992

After the collapse of the USSR Academy of Sciences of the USSR collapsed too. No money, no clarity, but we must go to expedition, equipment and consumables is necessary to purchase. By various ways we collected money. Most gave my dear wife Valentina. She had been saving for our family for furniture but furniture prices after Pavlov’s reform have skyrocketed, and now, as my wife said: “Let our money though will serve to science”.

Already in May we all the Laboratory went to the Aral Sea with Valery Semenovitch Kagan and Sergei Vasilyevitch Apraksin. Immediately we went to the canal in the Berg Strait, and after a series of difficulties in the shallows we right in large boat “Kazanka-2” were dragged into this canal. Because to find the canal was very difficult Igor Svetozarovitch Plotnikov and Davyd Davyidovich Piryulin climbed the cliff of the East coast of the former island Kok-Aral and tried to direct our boat to the canal. Their help us in the

boat was almost zero as the cliff was not high enough and the quality of radio communication between us was bad, either the batteries were old or talkies themselves were not completely good.

Meanwhile, as I have said, overcoming shallows we literally were sucked into this turbulent canal and we were able to collect all biological and hydrological samples and perform all necessary measurements.

When in the evening we returned to our field camp placed at one of Syr Darya branches, we briefly estimated the figures and felt that situation is very bad. A lot of water flows to the south and running water every minute deepens and extends this canal. Obviously, the flow will connect soon to the branch of the Syr Darya, and a couple of months this river will not fall into the Small Aral Sea but into the Large Aral. There is no doubt that after such redistribution Syr Darya flow the Small Aral quickly will dry completely.

Analysis of data collected in the canal continued the next day and emerging picture of the near future was becoming darker and darker. One evening at general meeting of the expedition it was decided that Valery Semenovich Kagan and I should go to Aralsk for reporting to the local authorities. We must urgently bring our observations and calculations to wide publicity. However we had acute shortage of gasoline. Meanwhile, all of our expedition members unanimously decided that we should go urgently.

May 29, 1992 V.S. Kagan and I came to Aralsk and we were admitted by Bigali Kayupov the first mayor of Aralsk. I first reported him paleolimnological and biological data and then Valery Semenoivich Kagan reported. Nominated by President N.A. Nazarbayev this mayor listened to both of us very carefully and friendly and

immediately asked to leave all the data to him. He also asked me to dictate to the secretary a very detailed section on the negative consequences of inaction and, of course, part of the benefits that will emerge if the dam will be built. We both did everything as asked Bigali, and then came back to our expedition camp to continue our fieldwork.

Exactly a week later on Friday June 5 police UAZ from the mayor came to our camp and driver brought a letter from Bigali. Handing letter he was very good-natured joking and said that on Friday is to pray and not on the car ride.

In this letter B. Kayupov asked me and Kagan to come with our data to Aralsk for further follow-up to Kyzylorda for reporting to Seilbek Shauhamanovich Shauhamanov. Throughout the night of June 5-6 Valery Semenovich Kagan and Igor Svetozarovich Plotnikov helped me prepare illustrations for the report. On the bathymetric map of Aral Igor Svetozarovich after some hesitation for some known only to him reason drew dam not as straight line but as a straightened Latin letter “V”. When I asked him why he did so he replied that the existing depth predetermines that the dam should be built by this way. “Yes, it will be longer than the dam laid on the line, but it will be stronger due to the bottom topography” – said Igor Svetozarovich.

Early morning of June 6 we departed to Aralsk and with all our data, pictures and graphics were in Akim’s office by noon. All day three of us – Kayupov, Kagan, and I worked on the materials brought. Much was reprinted or copied out, or redrawn, and only dam painted by Igor Svetozarovich with ruler and pencil, remained unchanged.

By Sunday, June 7 everything was ready and late at night Kayupov and his assistant, Kagan and I in two-compartment soft carriage went to Seilbek.

Bigali paid total and we with Valery Semenovich enjoyed comfort.

Report in Kyzylorda went well. Again I first spoke about paleolimnology and biology and then Kagan about hydrology. After the report Seilbek took all materials from us and said that we can be free. Bigali also said that he needs more help Seilbek to prepare documents and remained in Kyzylorda. To Aralsk Kagan and I returned alone. Not staying too long in Aralsk we returned to our field camp.



Fig. 9: Fish catch in Small Aral ©I. Aladin

When at the end of June our expedition was finished, Kayupov met us in Aralsk with good news that in Almaty, in view of our materials, it was decided to build the first experimental earthen dam in the Berg Strait. He also told me that one second rank captain advised him to arrest me for wrecking, but this accusation he broke and now we will help by every way to build this dam.

Before departure July 1 Bigali collected body of active functionaries of akimat and I did a detailed report on the future dam. This meeting attended Colonel V.P. Sinevich who also liked the idea of the dam. He said me privately: “This canal is our

military canal. Captain second rank that wrote denunciation on you to Kayupov a year or two ago deepened with dredger canal in the Berg Strait. Now the strait became shallow and the banks of artificial “ditch” made by our dredger appeared on the surface and our canal looks like a natural flow. Yes, the canal is being eroded by powerful water stream and becomes wider and deeper. We, military men, ought to put the end to this. We scratched it that time and now we will fill up it. I’ll call you to Leningrad and tell how things are going. Don’t offense on the second rank captain for denunciation, his children are small and he really wants to be captain of the first rank. I promise that the canal will be filled up this summer, be sure”.

Kayupov and Sinevich or their subordinates often telephoned me to Leningrad both to work and home and told all in detail. I retell the content of these calls to colleagues in our laboratory and we all rejoiced new successes in the construction of the dam.

However there was sad news. The first dam was built at the end of July 1992, but it was washed away immediately. The second dam was built in August and it resisted. As both Kayupov and Sinevich told as well as many other residents of Aralsk success came only the second time since the dam was built by all community. In July the dam was built only by military men and a number of technical services of Aralsk, but in August all community began work. There were even many young people with wheelbarrows, shovels and sacks. They carried on their wheelbarrows and carts bundles of reeds and sacks with clay and stones or just plain old junk and metal scrap in lacerated potatoesacks. Only common efforts were successful and in August the dam was ready. To the north of it there was water of Small Northern Aral Sea, to the south of the dam was arid desert Aral-Kum – the former bottom of the Large Southern Aral Sea.

Already August 17, 1992 for the first time I was able to report on the construction of a dam in the Berg Strait to international scientific community in Finland. Scientific report that I prepared after returning from expedition to the Aral Sea (together with two colleagues from our laboratory) was greeted very warmly and immediately it was offered to publish it. In Finland except for me there was my colleague from the Aral Sea Prof. Dr. Rustam Razakov from Uzbekistan. I never shall forget as he rejoiced over all success of Kazakhs on the Small Aral. Rustam Razakov is a wonderful example of clever neighbor who is rejoicing in their Kazakh brothers. We could do with such neighbors as Rustam.

Already on August 22 our deputy Director of the Zoological Institute Academician A.F. Alimov and I together flew to Barcelona at the 25th Congress of Limnology. Also in Barcelona in August the first premiere of the film shot in our expedition by Spanish broadcasters in 1991 took place.

August 30 I flew from Barcelona to Geneva to participate in the final meeting of working group for preparation of UNEP diagnostic document on the Aral Sea. September 1, 1992 I gave a talk at the Palais des Nations, UN. Because of this, I could not conduct my son to school for the first time to the first class. For some reason my wife often remembers and tells me that I love Aral more than the son... but she is wrong.



Fig. 10: Different views of the dam that separates Large Aral and Small Aral ©I. Aladin

In Geneva I met Prof. Dr. William Williams, Prof. Dr. Philip Micklin, Prof. Dr. Dietmar Keyser, Prof. Dr. Hilbert White and many other scientific colleagues that supported me with the idea of building a dam in the Berg Strait. Also on September 1 in Geneva I was first introduced to Uzakbai Karamanov. We immediately began to work closely and he began very well help me in the preservation of our already built first experimental earthen dam.

When the first day of the calendar autumn of 1992 in Geneva we discussed the past and future of the Aral Sea, it already became clear to everyone that the first dam has already started saving small Northern Aral Sea. That since the autumn of this year residents of this part of the Aral Sea will observe how its level rises again and the coast is not going away but starts to go back, and that once Small Northern Aral will be at all in its former glory.

From Geneva I went back to the Aral Sea, and thanks Uzakbaev already September 9 I was able to visit the dam with representatives of World Bank Mike Ratnam, Sunita Gandhi and other officials from the UN.

October-December 1992 was in the writing many papers and reading many reports as we all including me have a clear idea that the first spring flood in 1993 necessarily will erode our experimental earthen dam, and that urgently needs to think how to obtain new scientific data in order relying those to get money the World Bank to build real solid dam with controlled spillway.

The first dam was built in August 1992 entirely without spillway and everyone knew that it obligatory will be broken in spring 1993, and together with my colleagues in the laboratory I was preparing for very difficult 1993.



Fig 11: Two views of the spillway of the Kokaral dam ©I. Aladin

Besides these three Kazakhs and others there were very nice people that assisted the construction of the first experimental earthen dam: Kakimbek Salykov, Mukhtar Shakhanov, Umirzak Mahmutovich Sultangazin, Vladimir Sergeyevich Shkolnik, Serikbek Zhusupbekovich Daukeev, Aitbai Kuserbayev, Alashpay Baimurzaev and several others, but about this I'll tell later.

References

Here follows a list of references by professor Aladin in relation to Aral Sea and the dam. The references are classified per year, just as his text does (red.).

Year 1988

- Aladin N.V., 1988a. Reproductive salinity adaptations and salinity dependent feature of the embryonic development in Ostracoda and Branchiopoda. *Zool. J.*, 67(7): 74-982 (in Russian)
- Aladin N.V., 1988b. Osmoregulation in the Ostracoda. How the Ostracoda invaded freshwater and subsequently recolonised the sea. *Proceedings of 10th International Symposium on Ostracoda. Ostracoda and global events.* 21.
- Aladin N.V., 1988c. Osmoregulation in the Ostracoda and Branchiopoda. *Proceeding of 2nd International Congress of Comparative Physiology and Biochemistry.* 534.
- Aladin N.V., 1988d. The concept of relativity and plurality of barrier salinity zones. *Zhurn. Obsch. Biol.* 49(6): 825-833. (in Russian)

Year 1989

- Aladin N.V., 1989a. Role of preadaptation, parallelism and convergence in evolution of osmoregulation in Ostracoda and Branchiopoda. *Proceeding of USSR Palaeontological Society. XXXV session: 6-7* (in Russian)
- Aladin N.V., 1989b. Osmoregulation in Cyprideis torosa from various seas of the USSR. *Zool. J.*, 68(7): 40-50 (in Russian)
- Aladin N.V., 1989c. Morphology of the osmoregulation organs in Cladocera with special reference on Cladocera from the Aral Sea. *Symposium on Cladocera, Transca Lomnica. Abstracts:* 5.
- Aladin N.V., 1989d. Ostracoda of Kaynozoan. *Practical handbook on microfauna of USSR.* 3: 26-28 (in Russian)
- Aladin N.V., 1989e. Ostracoda of Kaynozoan. *Practical handbook on microfauna of USSR.* 3: 40-50 (in Russian)
- Aladin N.V., 1989f. Critical character of the biological influence of the Caspian water with the

salinity 7-11 ‰ and the Aral water with the salinity 8-13 ‰. *Proceedings Zool. Inst.*, 196: 12-21 (in Russian)

- Aladin N.V. 1989g. Zooplankton and zoobenthos in coastal waters near the Isle of Barsakelmes, the Aral Sea. *Proc. Zool. Inst. Acad. Sc. USSR*, 199: 110-114 (in Russian)
- Aladin N.V., Kotov S.V. 1989. The Aral Sea ecosystem original state and its changing on anthropogen influence. *Proc. Zool. Inst. Acad. Sc. USSR*, 199: 4-25 (in Russian)
- Komendantov A.Yu., Aladin N.V., Ezhova E.E., 1989. Environmental difference of osmo-regulation in *Lycastopsis augenery* (Polychaeta, Nereidae). *Zool. J.*, 68(4): 140 (in Russian)

Year 1990

- Aladin N.V. 1990. General characteristic of the Aral Sea hydrobionts from the viewpoint of osmoregulation physiology. *Proc. Zool. Inst. Acad. Sc. USSR*, 223: 5-18 (in Russian)

Year 1991

- Aladin N.V. 1991a. Studying of the influence of water salinity in separating bays on the Aral Sea hydrobionts. *Proc. Zool. Inst. Acad. Sc. USSR*, 237: 4-13 (in Russian)
- Aladin N.V. 1991b. Thanotocoenoces of separating bays and gulfs of the Aral Sea // *Proc. Zool. Inst. Acad. Sc. USSR*, 237: 60-63 (in Russian)
- Aladin N.V. 1991c. Salt lakes of the USSR with special reference to the Aral Sea. *Abstracts of talks presented at 5th Int. Symp. On Inland Saline Lakes, Bolivia.*
- Aladin N.V. 1991d. Morphology and physiology of the osmoregulation organs in ostracoda with special reference to ostracoda from the Aral Sea. *11th Int. Symp. On Ostracoda. Ostracoda in the Earth and life sciences.*
- Aladin N.V., 1991e. Salinity tolerance and morphology of the osmoregulation organs in Cladocera from Aral sea. *Hydrobiologia*, 225: 2291-299
- Aladin N.V., 1991f. The largest salt lakes of the USSR and their present state. *6th Congress of the All-Union Hydrobiological Society. Abstracts:* 32-33. (in Russian)

- Aladin N.V., Eliseyev D.O., 1992. The Aral Sea, USSR: A case study of Wetland Conservation Issues. *Wetland and Waterfowl conservation in South and West Asia. Abstracts*. Karachi, 1991.
- Keyser D., Aladin N.V., 1991. Vom Meer zur Salzwüste: Der Aralsee. *Ökozid*, 7: 213-228.
- Plotnikov I.S., Aladin N.V., Filippov A.A., 1991a. The past and present of the Aral Sea fauna. *Zool. J.* 70 (4): 5–15 (in Russian)
- Plotnikov I.S., Aladin N.V., Philippov A.A., 1991b. The past and present the Aral Sea fauna. *Scripta Technica*: 33-44.
- Williams W.D.W., Aladin N.V., 1991. The Aral sea: Recent limnological changes in their conservation significance. *Aquatic conservation: marine and freshwater ecosystems*. 1.

Year 1992

- Aladin N.V., Eliseyev D.O., 1992. The Aral Sea, USSR: A case study of Wetland Conservation Issues. *Wetland and Waterfowl conservation in South and West Asia. Abstracts*. Karachi, 1991.
- Aladin N.V., Plotnikov I.S., Filippov A.A., 1992a. Changes of the Aral Sea ecosystem resulted from the anthropogenous impact. *Hydrobiol. J.* 28(2): 3-11 (in Russian)
- Aladin N.V., Plotnikov I.S., Filippov A.A., 1992b. Hydrobiological Environmetrics on the Aral Sea in XXth Century. *4th Int. Confer. on statist. methods, for the Environmental Sciences*, Espoo, 1992. P. 113.
- Aladin N.V., Potts W.T.W., 1992. Changes in the Aral Sea ecosystem during the period 1960-1990. *Hydrobiologia*. Vol.237. P. 67-79.
- Aladin N.V., Williams W.D., 1992. Recent limnological and biodiversity changes in the Aral Sea and their conservation significance. *XXV SIL Int. Congress*, Barcelona, 1992: 655.
- Andreev N.I., Andreeva S.I., Filippov A.A., Aladin N.V., 1992. The fauna of the Aral Sea in 1989. 1. The benthos. *Int. J. Salt Lake Res.* 1: 103-110.
- Andreev N.I., Plotnikov I.S., Aladin N.V., 1992. The fauna of the Aral Sea in 1989. 2. The zooplankton. *Int. J. Salt Lake Res.* 1: 111-116.

The story of the disappearance of the Aral Sea has triggered the imagination of all and inspired artists. Especially photographers and movie makers, among others. Here follows a short list of documentaries and films on the Aral Sea:

- *The Hospital at the End of the Earth*, by Geoff Bowie and Petra Valier (2001)
- *Aral, fishing in an invisible sea*, by Carlos Casas and Saodat Ismailova (2004)
- *Aral, the lost sea*, by Isabel Coixet (2010)
- *Ghosts of the Aral Sea*, by Lucas P. Smith (2011)
- *Waiting for the Sea*, by Bakhtiyer Hudonazarov (2014)

