

What the future of the Aral Sea can be like

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Note to the reader

This article is the translation into English of the literal transcription of the plenary speech by the author at the Round table “Current Challenges and a Possible Future of the Aral Sea” during the VIII Nevsky International Ecological Congress “Ecological education – A clean country”, held in St Petersburg, Russia, in May 2017. Between brackets, you will find notes from the editors to help clarify the text. The translation and the figures have been provided by the author.

These are all the people who work with me [the authors gestures towards his coworkers, present in the room]. I used to have a bigger team, but my lab is shrinking, disintegrating and drying up just like the Aral Sea. But, you see, out of twelve people there is left a magnificent five. I would like Igor Svetozarovich to rise because here he is. He is two weeks older than I and a veteran of our laboratory. Here we all are in alphabetical order, but truly Igor should be the first because he does a lot. The others could not come, but Igor and I are here.

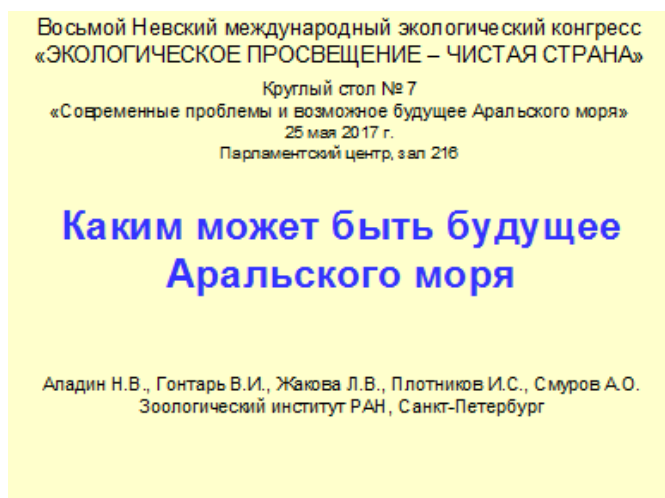


Figure 1: First slide of the author's presentation

This is our water-collecting area (Fig. 2), and I can say that there must be more comrades or gentlemen in this room, but I don't like the word “gentlemen”, I love the words “comrade” or “brother, sister”. So, there should be brothers and sisters from Afghanistan and brothers and sisters from the Islamic Republic of Iran, because the Aral Sea is refilled with waters of not only five countries of the International Fund for Saving the Aral Sea, but seven countries, and we must work. The new Head of the Office is Gurbanguly Berdimuhamedov and I would like him to ask the new leaders of Afghanistan and Iran to enter the International Fund. The International Fund should include seven presidents. This is my mandate, however, you can take it up.



Figure 2: The researchers' water-collecting area

Here is this picture (Fig. 3), which demonstrates that the Aral Sea is the world's fourth largest by area. The picture was taken unfortunately by the deceased Canadian scientist Theodore Hammer who was a good friend of mine. But he didn't have

space technology and therefore measured the area incorrectly. In fact, even when this textbook was being produced by Theodore Hammer, the Aral was the third largest lake in the world in area. It exceeded Victoria. But there was no space technology. The Germans showed post factum that the Aral was the third largest. But nobody took it into account. This is a map made by Butakov, also our Petersburg friend. I won't talk much about him, the map is available in Russian, and in English, it received great accolades, but I'll get it straight, we should keep all this now. These maps are in St. Petersburg. You can go to various museums on excursions. But I recommend going on an excursion to the Navy Archive. The Navy Archive keeps all these maps. You need to know your history.

picture was given by the American scientist Philip Miklin who is also a member of our team. Here, it is shown that seven countries give water to the Aral Sea.

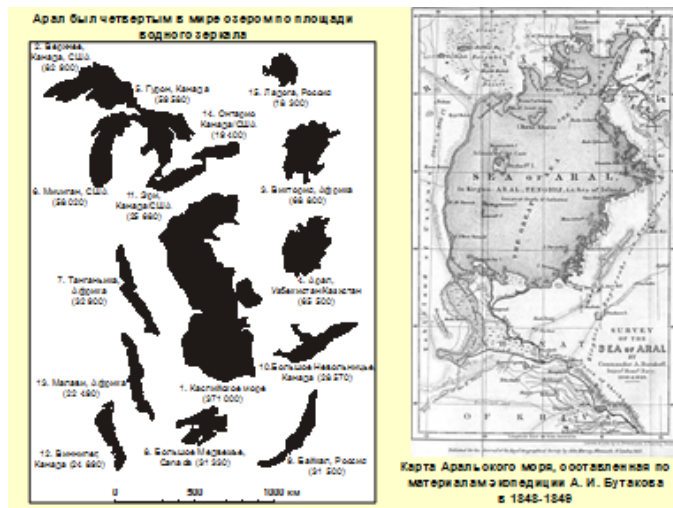


Figure 3: Map depicting the outline of several lakes (left) and the Aral Sea in the 19th century (right)

Well, it didn't work out, but I would say that here Igor Svetozarovich has used too modern technology. Why is it not showing? Because your programs are out of date. This is a criticism of your IT. What was shown in this picture? (Fig. 4) It showed which countries give water and how. The



Figure 4: Aral Sea basin

Next is the picture of the current condition of the Aral Sea (Fig. 5). Serious and not very serious people are asking me, when did we lose the Aral Sea? Everybody says: there is no more Aral Sea, it's over.



Figure 5: Current condition of the Aral Sea

Well, it might be over, but when something is over we must give the date of death. So, the date of death of the Aral Sea was in the late 80's. When Zalygin and the company embarked upon "The Aral 88" expedition, the Aral Sea had already died because instead of a lake with two rivers, there were already two lakes with one river each. So, this is the death of the Aral Sea. What we have now is not the Aral Sea, but the descendants formed on the site of the Aral Sea.

Well, here was a good picture of how we rescued the Small Aral, because it was really necessary to save the Small Aral. Here was a picture from our article, but, you see, my advantage is that I remember everything by heart and the picture is not an obstacle for me (Fig. 6). So, here it was shown how we made the dam. And how did we do it?



Figure 6: Dam between both Aral Seas

Nursultan Nazarbayev appointed akim Bigali Kayupov and Bigali Kayupov, the first independent akim listened to us. And we said: "We have to go to Seilbek Shahamanov in Kyzylorda". We went together. We arrived with Bigali Kayupov,

reported, hired my diving instructor, who has since emigrated to Israel, safe and sound, a good man. And the dam was constructed. Because it was reported to President Nazarbayev. Karamanov was then close to Nazarbayev, and the dam was built by local people.

On this slide (Fig. 7) one could see how beautifully this dam was built with the asana method – everyone brought whatever he had. Everything was in use: a bag of trash, some rubbish. Whoever had a shovel, brought it and dug.



Figure 7: Building of the dam

And now this dam has appeared. Well, those who love me, called it Aladin's dam. Those who don't called it Kokaral dam. And I called it the dam of Nazarbayev because I love Nazarbayev, because if Nazarbayev had not listened to Karamanov, nothing would have happened. And you see how the dam was built. It was built very simply: rolls of cane were made. Sand and some pebbles were brought. This is a Stone Age dam. But it worked. And below, you see, it shows how it broke as soon as the amount of water increased. Well, this dam is like the one in the Bible. Sisyphus rolled a stone

up the mountain, the stone fell back, but he still rolled it uphill, and the stone fell back again. Here, the Kazakhs always restored the dam.

Even this Stone Age dam, built in 1992, immediately gave results. Nobody put the fish back. They came from the Syr Darya River itself. It was not even necessary to spend money. Immediately, the fishermen began to live well (Fig. 8). There in the corner of the picture there is a flounder, which was put in by Dusia Markova, also my friend, a very good woman. God rest her soul. Zaualkhan Ermakhanov is still alive. In fact, he wanted to come here, but was short of money and refused to accept any support from me. I said to him: “Zaualhan, take as much as you want and come”. And he said: “Kolya, why would I take money? You’ll come to us yourself”. I’ll come. I’m flying to Kazakhstan, to Kyzylorda, together with Igor Svetozarovich on May 27.



Figure 8: Fish from the Aral Sea

That’s what we have created. [In the graph] (Fig. 9) you see how many fish there were, and we destroyed all these fish. What is marked with blue colour is the Small Aral. Red is the Large Aral. And

in the Large Aral there are no more fish, only in the Small Aral are there some fish. Only Kazakhs have “balyk”. And look how the “balyk” grows. This is all measured by Zaulkhan Kenzhegalievich Ermakhanov. Long live my elder brother, Zaulkhan Kenzhegalievich Ermakhanov!



Figure 9: Fish stocks in both Aral seas, see explanation in the text

Here [in the room] is Jean-Francois Cretaux, l’enfant terrible, who measures everything from satellites. Jean Francois, you understand Russian, don’t you? It’s you who measured everything? (e.g. Fig. 10) Right? (The reply is not heard). Well, I’m promoting you. So we worked with him too. His wife is from Kazakhstan. So we are already growing into Kazakhstan. And here you can see how the dam was falling into ruin and was repaired by the Kazakhs. Then they were given a grant and the real, new dam was built. The most interesting thing is that I was unable to take my son to his first class at school because at that time I went to Geneva to ask for money. My wife says: “What a jerk you are! Your son is going to school for the first time, but you are betraying him and going to beg for money”. I was granted the money.

Karamanov was there too. There were people from the Gandhi family – Mike Ratnam and Sunita Gandhi. They also gave us money. And this dam which was built using the asana method stood until its complete downfall on Lenin’s birthday, April 22. But it proved that water can be kept, and, if modern technologies are used in construction, it will stand. Here you can see “Topex/Poseidon”, “Jason”. Jean-Francois, is this “Topex/Poseidon” or “Jason”? (Jean-Francois replies in French). In general, I know that at first there was “Topex/Poseidon”, then “Jason”, and now a large number of satellites. Now we are doing work on the ground and he is watching it from outer space.



Figure 11: Kokaral dam

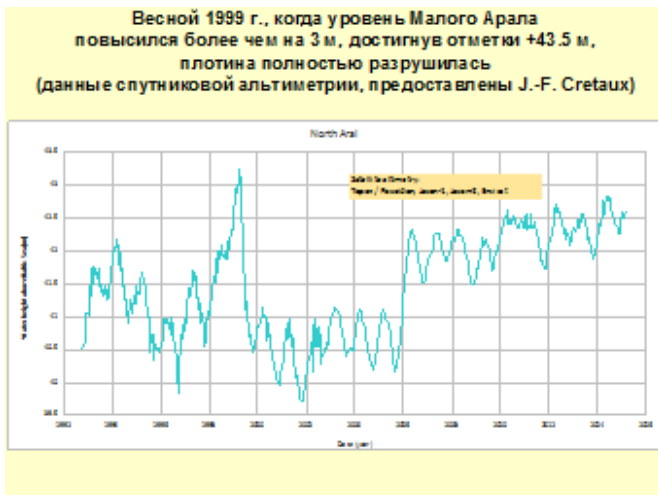


Figure 10: Water level satellite measurements

This Nazarbayev dam appeared. It is called modestly Kokaraldam (Fig. 11). It really is a manmade dam, a miracle of the 21st century because it saved the sea, restored normal life for the Kazakhs and all the people who live in that part of Kazakhstan. This is what happened. Have a look, in 1960 there were 13, and in 2011 already 13, and now it is less (Fig. 12). Yes, we have not achieved such a level, but we reduced the salinity and fish live well.

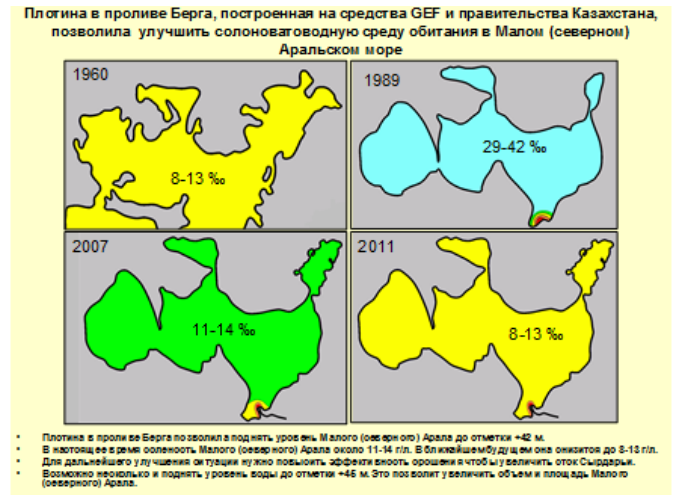


Figure 12: Salinity in the Aral Sea

We can build more. If you close “Aklak” and bring water and put a dam in Ushaki, then you can fill it up and Aralask itself will have water. You can fill it up or fill it in a different way, but I repeat, it will be almost a freshwater lake, so it is colored red (Fig. 13). There is an option, the road goes along the canal, along the railway. It doesn’t matter how they build it, but it’s important that they do. And these are the cheapest projects (Fig. 14).



Figure 14: Freshwater conditions in north Aral



Figure 14: Possible location for the new dam

Here is the same thing, which Jean Francois and his team from France are doing (Fig. 15). This is the Large Sea. You see, the Large Sea also dries up differently: in the east it dries up and, in the west, it still exists. I won't comment for long, he will take the floor and tell you everything himself.

Further. And this is a crustacean (Fig. 16). It gives crazy money. The previous leader of Turkmenistan, Saparmurat Niyazov, Turkmmenbashi allowed the hunting of Artemia

cysts in Kara-Bogas-Gol Bay and there was big money there. Gurbanguly Berdimuhamedov also granted the permission to harvest. The cysts are harvested in Kara-Bogas-Gol and they are used in the fish industry and are as precious as gold. The Americans said: "Kolya, it looks like sand, it smells like shit". These are not my words but Americans'. So really this is gold and this gold can be mined on the Aral Sea. On the Aral Sea Artemia cysts are also being mined.

С момента разделения Арала на 2 озера в конце 1980-х гг. уровень Большого Арала неуклонно снижается

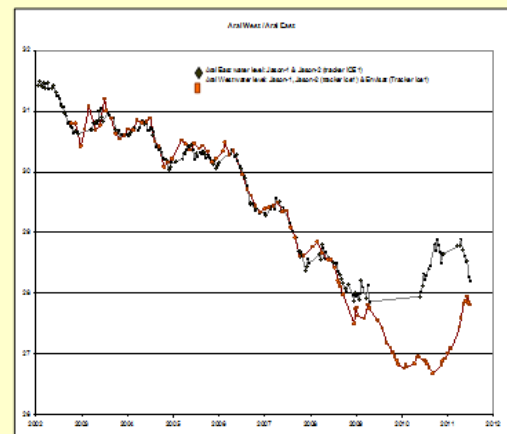


Figure 15: Water levels in west and east Aral



Figure 16: Artemia parthenogenetica from Aral

There is a Chechen who received a residence permit in Kazakhstan, he extracts these cysts from the Aral Sea and rakes in millions. He recycles scrap metal in Aktau, the former Shevchenko, and also sells these cysts. He is a billionaire. He redecorated all the mosques and all the Orthodox churches, because he is a billionaire, and he made his millions on these cysts. So if you want, I'll give you the address of this billionaire who is from Chechnya, but works in Kazakhstan.

And this is what happened to the Aral Sea (Fig. 17). You see, in the Middle Ages the Aral Sea was even more full-flowing than it is now. Hence, in the 21st century we managed to make the Aral Sea crisis better than our predecessors had done. Therefore, what is ruined by man can be mended by man. I'm not saying that we'll fix it one hundred percent, but we'll fix it.



Figure 17: The Aral sea in the Middle Ages (left), 19th century (middle) and today (right)

We work at the Aral not just in summer. We like working there in winter very much. This is how we traveled around the Aral in winter (Fig. 18). For some reason it's not quite clear to me why our

Kazakh friends have not released our film yet. I don't understand this at all. But we'll figure it out later; I think they'll soon release the film at the end of this year 2017.



Figure 18: Winter route around Aral

You see, we worked on the ice in winter on the Aral Sea, when the temperature was -30 to -40 and worked better than in summer because here the temperature rises to +40 to +50 degrees (Fig. 19).



Figure 19: Winter works in Aral

It is very difficult to bear, and against frost – put on a fur coat, felt boots, take a thermos with hot tea with a few drops of something else and you can work well in winter. Kazakhs love cold. Here Zaualkhan made a hole and is lowering a net, that is we work together, Kazakhs and Russians – in winter and in summer, in autumn and in spring (Fig. 20). Here are the fish (Fig. 21). The best thing about it is that it doesn't go bad quickly – throw it on the ice, transport it and sell it whenever you want.

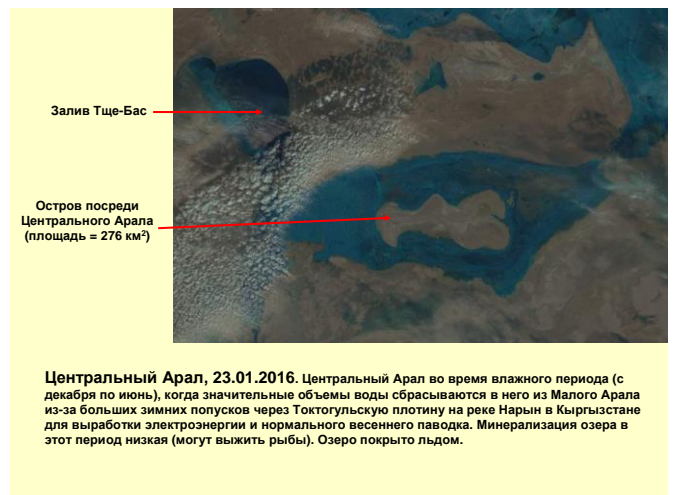


Figure 20: Catching fish in the ice



Figure 21: The fish harvest

Well, and this is what we now want. The water is flowing, we said that the dam had to be 48 meters (Figs. 22a-b). I said and Philip Miklin said, and those who were before us said that it should be 48 meters. But Uzakbai Karamanov told me directly: “Kolya, what if there is not enough water? They will shoot us if we build a 48 meter dam and it stands without water like a Kremlin wall. Let's make it 42. There will surely be enough water for it”. I said: “For Christ sake, let's at least build something. And we built a simple dam”.



Figures 22a and b: Flow of water in Aral

But this simple dam does not hold all the water, which keeps flowing. And see how it is flowing. Tuschebas is that part. Therefore, I don't mind the water flowing to Uzbekistan, but I wish it were beneficial for Uzbekistan. But it just evaporates there. Therefore, let's build something. What we need to build is in Fig. 22a. You see, the water started flowing, everything is covered with it (Fig. 22b).

So I say, and my colleagues from our laboratory – all five of them – say that the Kokaralsky dam must be raised by a meter or two. It won't cost much, I have estimates. We need to build in the area of Trekhgorka, Ushaki in Kazakh, close the Aklak, to adjust the water (Fig. 23).



Figure 23: Aerial view of Aral with its different sections

And the final thing, let the Uzbeks and all the people living in Uzbekistan forgive me – deliver the water to the south of Kulandy so that it stays there in order to unite and sustain Tuschebas. Therefore, a supposed southern dam is needed. The Southern dam will cost a few pennies. Honestly, I am ready to sell everything I have and raise money for the southern dam from my own funds (Fig. 24).



Figure 24: Possible location of the southern dam

And the last slides, two or three. This is the supposed southern dam which my family has enough money to build. There are five people in my laboratory, and five people in my family. If my lab adds more money, we'll build it even faster. So dear comrades, the leaders of Kazakhstan, if there is not enough money, take it from my laboratory and from my family.

I'm awfully sorry. It is necessary to raise the dam in the Berg Strait by 2–3 meters as soon as possible. Or by at least 2 meters, or at least 1 meter. Then build a dam at the throat of Big Sarah-Chaganak. It will be more expensive. I can't afford it. My lab and my family will collect the money for the construction of the simplest dam to the south of Kulandy.

And we should give up on the shallow water reservoirs in the delta of the Amu Darya. I realize, it's bad... You see, if I said that..., but I lived in Karakalpakistan, I spent days and nights there, and my friends are from there. These shallow water reservoirs dry out very quickly. In fact, giving water there is similar to pouring water on a hot frying pan. It evaporates too quickly. It's better to collect

all this water and redirect it to the Western Large Aral. Thus, it will stay alive. By the way, our overseas friend Philip Miklin, also aksakal, says that we must do this. Well, and the remaining water should be sent to the Western Large Aral Sea.

We had an expedition in 2005. By the way I... you, Amirjhan are my elder brother, I'm your younger brother, I totally agree. In 2005, I came to the Aral Sea to die. Everything in my body refused to work, and I was dying. But I walked barefoot for two and a half months, worked in this salty water and I came back absolutely healthy. And I now have many friends among the cosmonauts. Unfortunately, I invited three cosmonauts here including Alexei Arhipovich Leonov. And Padalka, and Seryozhka Krikalev. But they are in petty trouble in space now. So, they couldn't come. So, they said the following: "Kolya, we can link up over the Aral" (Fig. 25). So, in 2005 they are linking up over the Aral: "And you staying on the surface can not save the Aral Sea". And I said to all three of them that we would save the Aral if not completely, but we'll do it anyway.



Figure 25: Satellite over the Aral Sea

You see, the situation is getting worse. This is another cosmonaut – young Artemiev. Seryzhka Krikalev was born in 1958, he is a Leningrader too, we have known each other for a long time, and even others are familiar with him. So, I'm telling you directly, what you see here will be much better in a while. We will not save the Aral entirely, but we can make sure that the Kazakhs have a sea and the Uzbeks have a sea, and the future generations will have a sea. We will not bring back the Aral as it used to be, but we will make something similar to what it was in the Middle Ages. In the Middle Ages, it was the same. Why don't we live like in the Middle Ages for a while? And when we make synthetic food and get the energy from other sources, we'll leave all the water there and fill the Aral. That is, I'm a real optimist because I know that the Lord loves us and he will help us.



Figure 26: Satellite view of the Aral Sea

The Aral Sea has a future. It's not a photo collage (Fig. 27). It's done single-purposely. We had a colleague, unfortunately, he was killed by skinheads. He was very fond of taking pictures and liked to help me. So, we took this picture using GPS (there was no GLONASS at that time) and then when the second dam was closed we took this

picture and aligned it. This is after the construction of the current dam. Because Mike Ratnam, Sunita Gandhi and others supported our report in Geneva in 2002. And Uzakbai Karamanov was there, and we did it. Long live Kazakhstan which saved this sea! Long live other countries on this territory that supply water for the Aral Sea, because they also can save the Aral Sea even more. Only seven countries can solve this problem.

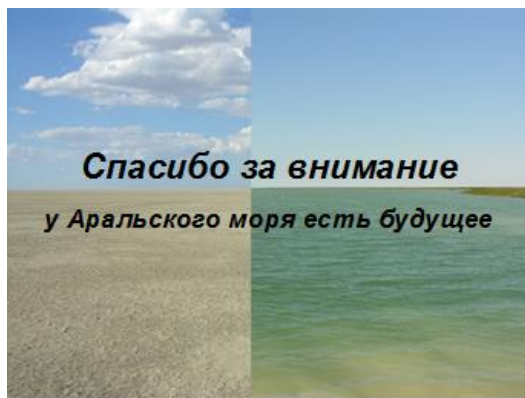


Figure 27: The future of the Aral Sea

This slide shows what is going to happen if we do not do a damn thing (Fig. 28). It's gloom that will come. Unfortunately, my school friend did not allow me to show a picture. His name is Misha Janson. We used to sit together at the same desk, but we chatted a lot and we were split up. So, he drew a picture. We have a badge. I'll get up so everyone can see. In Japan, there is an organization called International Lake Environment Committee Foundation which was founded on February 21, 1986. They say: "In order to do good science in the 21st century you need good equipment, good scientific programs and a kind, loving heart. But if you have only the equipment, only scientific programs but no heart, you will have nothing. Therefore, I believe that we'll have everything and there will be no gloom. The Lord is merciful to all those who love Him. This

is not religious propaganda, it's my belief. Thank you for your attention. I'm sorry for being so emotional. I cannot do science otherwise.

I want to thank my two school friends who have been with me since the first grade: Lyubov Georgievna, stand up, please, I beg you very much. The greatest lawyer of our time, my school friend from the first class, Lyubov Georgievna. Lenchka, stand up please. Another friend of mine, also since the first grade, I'm also very fond of her. Because nothing happens without love. And here I love you all, because I'm familiar with 80 percent of the people present in this room. Forgive me for keeping my hands in my pockets, forgive my emotions, but we will win. The Aral will be rescued with limited volume, and they will applaud to us. By the way, we perhaps will get a Nobel Prize. Not for some nonsense, but for a real job. So, join our team. Then we'll receive one big Nobel Prize for one, two or three hundred people. Because such people like Dukhovny, such people like Cretaux, Plotnikov, I have not listed all... Here sits Lukin, superman, ichthyologist. Lukin, will you, please stand up, comrade Lukin, He manages remarkably, and it's thanks to him that there are fish in the Aral Sea. The next person to speak is my student from Japan and he will present thanks to Lukin... Comrade Bolgov, don't laugh, you love me... (Remark, we are violating the rules of the meetings already). Yes, we are violating the rules. So, go out, have a laugh later, you'll make a report, you'll laugh.

I'm making a declaration of love to you all in my desire to get the Nobel Prize with you, and most importantly – to save the Aral for the people who live there. That's all. And Khalil Zakarievich, Ulken Rahmet. Many thanks, comrade Rumyantsev, I've already said to Natochin and will say it again.