

## INSTEAD OF CONCLUSION

As an editor of this collection of articles I would like to take advantage of this tribune and speak on some important matters. I would like to notice, that these are my thoughts and they are not the official point of view of the commission at all and may be challenged.

The commission's future is dim. But future doesn't occur by itself and is made by people. It doesn't bring much good that this commission organized in 1989 changed so strongly.

It became easier to explore glacial caves but recently serious research in glacial caves was carried out rarely. Most active members of the commission have grown old and retired from research of glacial caves or have died, and new members in the commission, unfortunately, are little in number. Problems are visible constantly. It is indicative, that many problems of the commission are seen clearly in the light of symposiums realization. Last two symposiums of GLACKIPR have gathered very few participants. On Spitsbergen there were just few of them, and on Caucasus there were basically participants from Russia, others participated in the symposium mainly in absentia. What is more, it is absolutely unclear when and where the next symposium would take place and who would organize it.

During the organization of 7<sup>th</sup> GLACKIPR symposium I hoped that it will be possible to involve not only cave explorers and karstologists but also glaciologists (as it was made on 4<sup>th</sup> GLACKIPR symposium in Austria). Unfortunately it was impossible. There is an opinion, that the commission has become obsolete, that studying of glacial caves inside the framework of speleology has gone to impasse, and in future commission the direction of research of karst caves with permanent ice will prevail only.

Nevertheless, it seems to me, that there is a future for the commission. Despite of apparent hopelessness of position in the Speleological union, the commission may not be moved into another body, for example, Glaciological union, even because glaciologists in the majority have no speleological training and consequently are not capable to study moulins (which are numerous on glaciers in comparison to glacier caves).

A following choice is possible: the commission in future remains in the Speleological union, but will be under patronage of the Glaciological union. In this case members of the commission will not be closed on themselves, and will participate in the life of Glaciological union. Also, participation of commission's members in glaciological expeditions and in glaciological symposiums is possible. Such association (if it will be informal) is capable to stir to activity of the commission. But I also hope, it will bring mutual advantage to both unions.

Such association is historically determined. The first researchers of glacial caves were natural scientists and glaciologists. But technical difficulties of glacial caves exploration (especially vertical ones) did not give an opportunity of development of this direction within the framework of glaciology. However now in glaciology there is a rather paradoxical situation. Almost all explorations which are carried out on glaciers including study of their internal structure and conditions are carried

out using remote methods, except for bore drilling. It means that many theories constructed in glaciology are not checked, may not be checked or may be checked only partly. Undoubtedly, bore drilling and supervision of them with the help of videocameras is a good and perspective method. But a borehole is made where it is convenient for drilling, and not where the channels of an internal drainage network of glaciers are. And consequently these point penetrations into thickness of ice frequently give very little information. On the contrary, exploration of internal drainage systems of glaciers is a very perspective direction because water in ice thickness determines many properties of ice and glaciers; and water flow through just channels of an internal drainage is studied by cave explorers. Despite of apparent localness of objects of research (moulins), it is possible to say precisely that water moves inside ice exactly through moulins and that water flows through glaciers inside directly these channels. Getting into the channel of drainage system of a glacier, we are capable to understand the structure of internal channels in ice and also to understand their evolution and dynamics in time. And to understand, that the drainage system is responsible for many processes occurring in thickness of a glacier. They are responsible for the absence and occurrence of surges in glaciers, outbreaks of glacier-dammed lakes, changes of ice properties, springtime motions of glaciers etc. Channels in glaciers can be compared to blood or nutritious system in a body of the person. It is known that the first researchers of glaciers named channels in ice as «ice guts». Through this system of internal channels the glacier receives external influence: water and warmth from the surface (and receives them very quickly - water passes through glaciers in few hours), snow and air. The system of channels is not only a conduit system, it reacts very sensitively to the condition of glacier and changes according to it. As glacial channels are sensitive mechanisms in ice body they demand special studying. And only glaciology is capable to give the extensive information about structure and change of condition of channels of an internal drainage network of glaciers. Only cave explorers may place devices in ice thickness and as doctors carry out measurements directly in ice guts. This means, that speleology allows to speak with the greater confidence about condition of modern glaciers. And today the union of speleology and glaciology is urgently necessary. Absence of such union has resulted in essential losses on both sides. Cave explorers have lost interest to studying glacial caves. That has happened, first of all, because of full ignorance of results of this research by glaciologists. Rather big database about internal drainage systems (glacial caves) of many glaciers in different regions of the world was already collected. But this data till now is unclaimed. And it's a pity that knowledge received by extreme efforts remains unneeded. All of this can be avoided if we will research glacial caves under certain glaciological tasks. Besides, joint efforts would make studying glacial caves much more productive than now.

As it seems to me only joint efforts can probably give decision to many problems in glaciology. Only efforts of commission's members can help glaciology enter in the category of exact sciences and not to be based only on assumptions. And it is the task of all commission's members to inform glaciologists about that.

Bulat Mavlyudov