

The recent engineering geological forecasts show that today the intensity of the processes occurring and their temporal scale cannot be reliably forecast. The mud-flow protection dam near the Alma-Ata city is indicative of this. The dam sustained a powerful mud-flow blow and was filled to three quarters of its capacity, though the mud-flow reservoir capacity was designed for 100 years.

In this view, the attempts of systems approach to the solution of the problems of geological environment protection (a report by Shubin) are extremely interesting, as is the successful factorial analysis, with the use of computer, of the Sivask Lake pollution due to the filtration of sewage water of chemical plants (a report by Koff. Kolomensky).

In conclusion Sergeev underlined that today recent investigations show that the main effort should be directed towards understanding the mechanism of the interaction of hydrotechnical structures with the geological environment and towards the creation of an intensity and time-scale of occurrence of man-induced geological processes.

#### A. Rónai: "Lowland barrages and reservoirs on the Great Hungarian Plain"

Rónai in his report devoted to lowland dams and reservoirs stressed that construction and operation of dams and reservoirs in the Great Plain of Hungary is extremely challenging, being determined by the peculiarities of relief, geological structure and climatic conditions.

It is a difficult and complicated undertaking to build a dam and reservoir on a flat plain where over hundreds of kilometres the difference in level is 4–5 m, and rivers have a very low gradient, the Holocene and Pleistocene thin-laminated clayey-sandy-silty sediments complicated by fissuring form the foundation of the structure and where evaporation in a reservoir is very high.

Rónai considered the experience in design, construction and operation of three dams of the Tisza River and reservoirs: the Tiszadob, constructed in 1954, and Kisker, the first phase of which was completed in 1973 and subsequently in 1980–1985. The major aim of hydrotechnical construction on the Tisza River is the irrigation of vast territories and the provision of river navigation.

A peculiarity of the reservoirs considered is construction of lateral levees bordering the reservoir, enabling a considerable rise in the river level, creating the necessary water stores and simultaneously to avoid submergence of vast areas of useful land and diminish losses by evaporation. During design and construction a number of complicated tasks related to the high level and high mineralization of groundwater had to be tackled. For observing the level of groundwater, a network of control wells on the irrigated territories was installed.

In view of the fact that hydrotechnical construction completely changes the landscape over vast areas, Rónai stressed that while protecting irrigative water from mineralization and controlling changes in groundwater levels over irrigated territories, one of the basic requirements for every big project is realized: the protection of the environment.

Reservoir construction in the lowland conditions of Hungary raises the problem of their complex use not only for hydrotechnical purposes and navigation but likewise for recreation, sports, fisheries. Such a complex approach, in Rónai's view, is of particular importance for lowland territories and is no less challenging than dam construction in mountainfolded areas.

The Symposium was followed by a technical excursion which provided an insight into hydrotechnical construction in Georgia, where it is of great economic importance. The participants became acquainted with experience in using the resources of mountainous rivers, engineering geological investigation for construction materials, design and construction of hydrotechnical objects under complicated mountainous conditions. Thus, for example, of particular interest to the participants was a visit to the Inguri HES, a unique complex of 5 hydropower plants, which is at present being constructed.

Summing up, it can be stated that the Symposium was fruitful and enabled not only the strengthening and successful development of scientific, but likewise friendly human contacts between scientists from different countries of the world.

## Opening Address

### Allocution d'ouverture

Dear Colleagues,  
Dear Comrades,  
Ladies and Gentlemen,

The International Symposium we have assembled for is devoted to a problem of great importance – the role of engineering geology in hydrotechnical construction. Hydrotechnical construction is diverse. It secures the progress of the energy base of mankind, the efficiency of agriculture; it creates appropriate conditions for industrial development. It can be said with confidence that hydrotechnical construction fosters scientific and technological progress. Therefore, most countries of the world make large investments in it. To obtain the maximum efficient return from the investment into hydrotechnical construction is a universal objective. It can be attained only when a correct understanding of the engineering geological conditions under which hydrotechnical construction is carried out is secured, i.e. when account is made of all the natural, primarily, engineering geological factors, having an influence on that kind of construction. The International Association of Engineering Geology is called upon to promote and encourage the advancement of engineering geological research, disseminate results and failure in engineering geological activities all over the world, expeditiously and for benefit of all. Therefore, the IAEG Council had unanimously accepted a proposal of the USSR National Group regarding the organization of this symposium. As the President of the IAEG I would like to outline two circumstances: first, the symposium "Engineering geological problems in hydrotechnical construction" takes place in a country where a lot has been done in the field of hydrotechnical construction as an implementation of Lenin's Plan of Electrification. The organization of the symposium in Georgian Socialist Republic has achieved considerable progress in this line. Hence, our symposium is organized on a good basis.

Second, a great number of reports have been submitted to the symposium, many prominent scientists from various countries attend it, and this provides grounds for hope that the symposium will be a success.

Every international symposium held under the auspices of the IAEG is another step forward in the development of engineering geology. Engineering geological science is becoming ever more versatile, it is tackling the most diverse problems, in particular, the problems of the rational utilization and protection of the geological environment. Under these conditions the role of international meetings enhances the direct contacts between scientists and contributes to the understanding of various viewpoints in comparison to the reading of published contributions.

The personal contacts between scientists realized at international symposia have still another positive feature: they enable us to understand each other better not only regarding the scientific problems but also from the common human viewpoint, for mutual understanding between people paves the way to the relaxation of tension in the relations between separate countries, to the strengthening of peace the world over. Allow me to welcome all the participants to the symposium and to express assurance that this symposium, which is held on the hospitable Georgian soil, will foster further advancement of engineering geology, foster raising efficiency of hydrotechnical construction, promote mutual understanding between people and secure stable peace over our little beautiful planet – the Earth.

E.M. Sergeev  
President IAEG