Widening of the extent and content of stratigraphic studies is a systems approach to the solution of problems of hydrotechnical construction.

An important role in the geologenetic aspect of engineering and geological studies of IDMC belongs to investigation of stratigraphy. “Geological mapping is appropriate only under the condition that it is based on differentiation of the age (according to the feature of succession of formation) of all the geological bodies mapped. In other words, only the maps with correctly understood stratigraphy can be termed geological maps, and the legends of the latter should necessarily reflect the time of formation and the geological age of the sedimentary, metamorphic, and magmatic rocks mapped” [2].

Content, volume, and tasks of stratigraphy. “Stratigraphy as such not only studies the original succession and the age proportions of strata of mountainous rocks but also their shape, propagation, depositional composition, content of fossil organisms, geophysical and geochemical properties, i.e., all the properties, features and qualities of rocks as strata, and interprets them in terms of the conditions of the ambient, the method of formation, and the geological history” [4].

Stratigraphic methods for studying IDMC have specific features. For example, the use of the paleontology approach is quite limited because metamorphic rocks are usually devoid of mineral remnants of fauna. The methods of lithostratigraphy and rhythmostratigraphy have special importance for engineering-geological studies carried out for purposes of hydrotechnical construction. In this connection we should recall the words of V. I. Osipov that “the genesis of ground in its engineering-geological understanding is a whole set of geological processes that occur in the ground in different stages of lithogenesis and determine its recent state, structure and properties” [5]. Lithostratigraphy is a “division of stratigraphy that divides strata into substrata on the basis of their
lithological features” [4]. In the opinion of I. S. Romanovskii “...in today’s understanding lithology has virtually become a collective term covering the entire spectrum of problems connected with studies of sedimentary rocks. It seems that lithology has turned into a kind of synthetic “science on sedimentary rocks” that includes quite developed scientific disciplines, i.e., lithology, petrography of sediments, facial and formation analyses, strata studies, and, finally, sedimentology, as individual divisions” [6].

The concept of adherents of the rhythmrostratigraphic approach to the division of mute terrigenous rock massifs is based on the assumption of the impossibility of repetition of two absolutely identical rhythms (cycles) in a section and of their unidirectional evolution, i.e., from continental to marine uncompensated sedimentation and then to marine compensated sedimentation [7, 8]. The practical significance of rhythmrostratigraphic methods is not exhausted by stratification and correlation of sections, as erroneously presumed by S. I. Romanovskii [6]. The results of simulation of the process of formation of flyshoid recurrence performed by A. V. Luk’yanyov and I. G. Shcherba with the use of an IGL hydrointegrator allowed them to determine the conditions of appearance of a self-oscillating system in a sedimentation basin and the causes of formation of zones of flyshoid sediments [9]. These experiments confirmed experimentally the hypothesis that the rhythmical structure of sedimentary strata is not always connected with external action. A sedimentation basin develops as a self-oscillating system. Accumulation of deposits on the declivity of the sedimentation basin causes formation of slopes with critical steepness. The unstable part of the declivity with a lens shape falls and the mass of thixotropic sediments displaces to deeper parts of the sedimentation basin with a flatter bottom. This process repeats periodically and the rhythm depends on the parameters of the basin and on the intensity of the inflow of the material from the bank. In the actual fact the rhythm is a reflection of internal oscillations of the system and of periodic external effects.

The recent material composition and the morphology of the structures of IDMC strata reflect not so much the conditions of the sedimentogenesis as the results of their subsequent transformations. The original material composition could have been caused by underwater erosion and landslides, the processes of diagenesis, katogenesis, metagenesis, metasomatosis, tectogenesis, epigenesis, etc. The recent material composition of lithostratigraphic substrata can be represented by a very complex combination of rocks of various genetic types, the initial composition of which could have been homogeneous. If the aim of our stratigraphic study is to show the initial material composition of the rocks of a specific lithostratigraphic unit of a section in a geological map or section, we have every reason to characterize this lithostratigraphic unit by a corresponding index of relative age. But in this case too, when the material composition of the rocks differs substantially from the initial one (especially when it differs from the initial composition by different degrees) the age of the changed rocks corresponds already to the age of the process of variation of the initial composition rather than to the age of the sedimentogenesis. In this case we may speak of sedimentogenesis only as of a paleogeographic reconstruction and base ourselves on a study of the processes of transformation of the initial composition.

If we want to reflect the morphology and the composition of bedding structures in the construction of a geological model as accurate as possible, as well as their space and time relationships with vein and intrusive formations, products of metamorphosis and metasomatosis, we will encounter difficulties surmountable only after the inevitable widening of the volume and content of stratigraphy. For example, the description of stratigraphic succession and facial variability of stratification structures in the phyllite rock massif of the Tehri purgatory is impossible in principle without a detailed description of the two main folding generations, a network of ancient (strongly degraded) and young tectonic disturbances, the nature of tectonic boudinage, and metamorphic changes in the composition of original rocks.

As applied to IDMC, stratigraphy as a scientific discipline can be treated as a connecting link of virtually all geological disciplines, because any of them can be considered as an instrument required for solving problems of stratigraphy (within specific research problems). At the same time, it is difficult to imagine a geological discipline absolutely independent of stratigraphy. The tasks and the subjects of the study, the axiomatic theories lying in the foundation of various disciplines can be fully independent of each other and of stratigraphy, but in the sphere of practical application of the results of research their close interrelation with stratigraphy becomes inevitable.

As an example we can consider the relation between stratigraphy and structural geology, i.e., a division of geotectonics that studies the forms of geological bodies and ruptural disturbances but does not study the material composition. The practical significance of structural geology research without studying the material composition is limited, because shapes are not related unambiguously with the genesis of geological bodies (for example, bodies of lenticular and spherical shapes can be formed by absolutely different processes). The situation with the study of ruptural disturbances and tectonic cracks without investigating the stratigraphy of the embedding geological ambient is even worse. On the contrary, structural geology acquires greater theoretical and applied importance when it is included into stratigraphy and considered as a tool for widening the volume and content of stratigraphy.

The boundaries separating the problems of geotectonics and stratigraphy are not obvious. Geotectonics, which studies structures of the upper mantle of the Earth and their evolution in time and space [3], differs from stratigraphy not so much in essence as in the scale of the bodies, processes, and time intervals considered. Competing tectonic hypotheses often have a common drawback, i.e., they do not include the description of a mechanism that can be used for confirming or negating their validity. As I. G. Kalyaev has put it “...a scientific hypothesis is by no means an arbitrary guess or a sim-