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CONTENTS OF FOUR REPORTS (GEOPHYSICAL) HEARD EARLY 1952
AT A GENERAL MEETING OF THE DEPARTMENT OF TECHNICAL SCIENCES

Anonymous

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Note: The following information is abstracted from an article appearing in the regular "Scientific Sessions and Meetings" section of the monthly 'Vestnik Akademii Nauk SSSR', No 6, (June 1952), pages 109-112.

At the last regular meeting of the Department of Technical Sciences, the following four reports were heard:

1. Corresponding-Member, Academy of Sciences USSR, V. V. Sokolovskiy, "Methods for Designing Earth and Hydrotechnical Structures", a report devoted to investigations conducted at the Institute of Mechanics, Academy of Sciences USSR, in 1951 to assist the great construction of communism.

2. Senior Scientific Associate in the Section [otdel] of Elasticity Theory, Doctor of Technical Sciences, V. A. Florin, "Phenomena of 'Dilution' of Friable Water-Saturated Sandy Soils at the Foundations of Hydrotechnical Structures", a co-report of work by the Institute of Mechanics together with the Leningrad Polytechnical Institute imeni M. I. Kalinin, Hidroproyekt [Hydroproject], and Kuybyshev Gydrostroy [Hydroconstruction].

3. Doctor of Technical Sciences V. Z. Vlasov, "Spatial Constructions of Hydrotechnical Structures and New Problems of Structural Mechanics", a report on results of his researches with the aim of obtaining new economically convenient constructional forms for dams, support walls, gates and other hydrotechnical structures.

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4. Corresponding-Member of Academy of Sciences USSR, A. N. Kostyakov, "The Development of Irrigation in the USSR and the Great Structures of Communism", a report on the irrigation of steppes, deserts, and semi-steppes as part of the plan of enterprises for the transformation of the nature of arid regions.

[Further details follow, under same numbers.]

1. The Section on Elasticity theory at the Institute of Mechanics have paid great attention to working out the problems that possess essential significance for the planning of large hydrotechnical structures; especially problems on the stability of foundations, slopes of earth excavations and fills, and also problems on ground pressures against retaining walls.

As a result of investigations by V. V. Sokolovskiy and associates at the Section new methods have been developed for easily obtaining numerical results on stability of hydrotechnical structures raised on foundations of friable and cohesive grounds, in certain cases in the form of graphs and tables.

In 1951 they developed a theory of limit equilibrium of noncohesive grounds, and began to develop a theory of the elastico-plastic state of grounds; in this new problem encouraging results are being obtained for the first time.

Theoretical and experimental investigations in a number of other important problems were conducted in cooperation with the Leningrad Polytechnic Institute imeni M. I. Kalinin; in particular, methods for designing alluvial dams were developed. The 'Hydroproject' took over that part of the work concluded in 1951 relating to investigations of the filtration regime during alluvium, which take drainage devices into consideration.

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In 1952 the Institute of Precision Mechanics and Computational^{ing} Techniques, Academy of Sciences USSR, and the Leningrad Department [otdeleniye] of the Mathematical Institute imeni V. A. Steklov, Academy Science USSR, are taking part in the further expansion of these works.

2. During the discussion after the second lecture, Candidate of Technical Sciences P. I. Klubin pointed out the necessity of extensive investigations in the field of the spatial problem of elasticity theory, and especially emphasized that these investigations must not be limited to separate experiments, whose results are not always amenable to engineer practice.

Corresponding-Member of Academy of Sciences Ukrainian SSR, I. Ya. Shtayerman expressed a number of comments on possibilities of further refinement and simplification of methods for designing earthen hydrotechnical structures and their foundations.

Engineer I. V. Fedorov (VODGEO), noting the lag of experimental investigations behind theoretical developments and behind the demands of practice, recommended that the Institute of Mechanics, Academy Sciences USSR, set up more extensive experimental investigations without duplicating the work of branch institutes, in as much these latter ordinarily are occupied with solving such problems as are not connected the verification of theoretical data. In the opinion of I. V. Fedorov, the Academy of Sciences USSR should create a special organization which would coordinate scientific research work in the field of ground mechanics and foundations when conducted by various institutions.

Candidate of Technical Sciences, B. N. Popov, and President of the Hydroproject, M. M. Sokol'skiy, recommended that measures be taken for expanding computational work connected with the practical application of results of theoretical investigations conducted in the Institute of Mechanics, Academy Sciences USSR.

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3. In 1951 at the Institute of Mechanics, V. Z. Vlasov in cooperation with associates of the Central Scientific-Research Institute of Industrial Structures effected investigations on the designing of hydro-structures under the action of hydrotechnical loads and temperature. He also considered various variations of lightened spatial constructions of the thick-wall type. Work was conducted on the basis of a general bimoment theory, developed by V. Z. Vlasov, of thin and thick one-layer and multi-layer shells and plates, of both constant and variable thickness. Preliminary researches show that the expenditure of constructional materials can be decreased 25-30% by the introduction of spatial lightened constructions of the shell type.

4. A. N. Kostyakov states that field-protective forest plantings and plains grass crop-rotation can reduce water requirements by 20-25%, according to preliminary data. The lands to be newly watered, under the great constructions of communism, will exceed 28 billion hectares.

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