LIFE AND ACTIVITIES OF ALEXANDER (YASHA) KHVOLES (1920-2017)

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Alexander Khvoles was born on November 27, 1920 in Tskhinvali, Georgia. He was a grandson of the famous local rabbi Avraham (Abram) Khvoles.

Alexander Khvoles, 2010

At the end of the 19th century Rabbi A. Khvoles arrived in Georgia from Lithuania to raise funds for education. In Tskhinvali, he made such a great impression on the local Jewish community that he was asked to become their rabbi. On the advice of his teacher, he accepted the position. To get a residence permit, rabbi Khvoles agreed to simultaneously serve not just as a spiritual rabbi, chosen by the local community, but also as a so-called state rabbi, appointed by the authorities for keeping the civil books status. Thus, in Georgia, 25 years after the abolition of serfdom, when the cases of pogroms and blood libels have not yet been erased from the memory of Jews, the first Ashkenazi rabbi appeared and went down in history as an outstanding religious and public figure and the educator of Georgian Jews.

Alexander Khvoles learned to read early at the age of 4, and before that – to add, subtract, divide and multiply large numbers. At the age of fifteen he graduated from high school, at twenty-one – from the mathematical faculty of the Tbilisi University. The same year, on the recommendation of academician V. Kupradze, his first scientific paper was published in the periodical journal of the Georgian Academy of Sciences "Moambe". The paper was devoted to the Fredholm third kind integral equations. This kind of work at the University was directed by acad. V. Kupradze.

Alexander Khvoles, 1945

1941 was a very hard year for the citizens of the Soviet Union. A. Khvoles was supposed to be drafted into the army but by the efforts of leading Georgian mathematicians his conscription was postponed.

Upon graduating from the University he began working as a mathematics teacher at the Rustavi Aviation Military School where he had been working before he was called up to Army. After that he was enrolled at the Tbilisi artillery school which he finished with the rank of Lieutenant. He had been taking part in the battles near Kursk and later in Ukraine. He was wounded several times but he did not abandon the army until he was discharged from hospital as an invalid of the Patriotic War. For his bravery he was awarded several orders, among them the order of Red Star, I and II degree orders of the Great Patriotic War, and more.

Since 1945 Alexander Khvoles had been working as an assistant at the Tbilisi State University. Here in 1949 he defended his candidate's thesis "Fredholm third kind integral equations" (scientific supervisor V. Kupradze). After defending his thesis, A. Khvoles began working at the Tskhinvali Pedagogical Institute, and since 1952 he had been working at the Tbilisi Institute of Railway Engineering.

Alexander Khvoles, 1951

After the Seminar (1968).
From the left: I. Vekua,
Sitting B. Khvedelidze, E. Obolashvili,
T. Kskhadaia,
Staing G. Kharatishvili, A. Khvoles,
V. Jgenti, G. Mania, Sh. Pkhakadze,
T. Gegelia, R. Kordadze

A. Khvoles was participating in the formation and development of School №42 (now named after Ilia Vekua). He had been inviting famous scientists as teachers, and he himself taught some of the subjects there. Later when the Computing centre of the Academy of Sciences had been founded, he was the Head of the Department of Mathematical Programming and the members of this department had been working on different important problems.

At the Chair of approximate analysis and computing technique of the Faculty of Mechanics and Mathematics of Tbilisi State University which was headed by Shalva Mikeladze, since 1960 there has been functioning the laboratory of electronic computing technique, on the basis of which, on the initiative of Ilia Vekua in 1966, the problem scientific research laboratory was founded with the rights of the Institute. Later it was transformed into an Institute and A. Khvoles had been working there since 1966. From the very first day of its foundation he had been the head of one of its departments, namely, that of problems of physics and engineering. The staff of the department was international and he had very warm and friendly relations with them, especially with the young members of the department.

A. Khvoles had very wide scientific interests and they had been described in booklets, commemorating the 45th and 50th anniversaries of founding I. Vekua Institute of Applied Mathematics. They contain the whole spectrum of problems he and the members of his department had been dealing with. Here are some of them:

- The complex representations of solutions of governing systems of I. Vekua's models in the Nth approximation are derived for cylindrical and spherical shells (A. Guentner, L. Kiknadze, A. Khvoles, V. Zhgenti).

First Scientific Council of Institute of Applied Mathematics of TSU.
From the left: Sh. Nikolaishvili (Vice Director, 1971-1976), K. Loladze (Vice Director, 1968-1980), T. Gegelia, A. Toronjadze, G. Kharatishvili, G. Mania (Vice Director, 1968-1971), I. Vekua (Chair of the Council, Founder and Director of the Institute 1968-1977), A. Gethia, M. Bahseleishvili, A. Khvoles, R. Skhirtladze

- The construction of general solution of I. Vekua system of equations of an isotropic plate of constant thickness for an arbitrary approximation.

- The construction of a general solution of I. Vekua system of equations for the equilibrium of an anisotropic plate with constant thickness in case of arbitrary approximation.

- A. Khvoles was the only one among the mathematicians of several generations in the fifties and seventies of the last century who took up Ilia Vekua's challenge of exploring the well-posedness of boundary value problems for cusped prismatic shells. In his papers he gave the decomposition of the bending operator of a class of cusped prismatic shells that greatly contributed to the development of research in this direction.

- The solution of some linear inverse problems of the theory of engineer seismology and seismic stability, taking into account the thickness of ground and dissipative properties of the building, has been reduced to the solution of the system of second order linear differential equations or first kind integral equations of Volterra type. The recurrence formula for the approximate solution of these equations have been given, the methods of constructing oscillograms for rocky ground and foun-

dations of buildings have been worked out. The oscillograms in case of destructive earthquakes have been obtained, as well as the formula for the numerical differentiation of oscillograms. The accelerograms of oscillations of rocky ground have been estimated and the ways of restoration of seismic oscillations of foundation ground have been found out (T. Vekua, A. Khvoles).

- The effective, stable algorithm of computing arch dams and processing programs. The solution of problems, connected with computing the stability of hydrostatic load of arch dams of any shape and arbitrary temperature effect. Taking in view the action of transversal forces in arch and arch-gravitational dams, the variational-bar method of computing dams has been worked out. Worth mentioning is also the creation of the automatized program of computing stability on hydrostatic and specific weight for symmetric, weakly twisted arch dams with three-centre archs (A. Kozhiashvili, A. Chachanashvili, L. Tsamalashvili, A. Khvoles).

- A. Khvoles had been taking an active part in computations for building the Enguri hydroelectric power plant as well as other problems of practical importance.

The witty technique of his mathematical investigations has been recognized by many distinguished mathematicians in Georgia as well as in the Soviet Union and abroad.

On the Occasion of the 90th birthday Anniversary of Dr. A. Khvoles.
From the left: E. Evseev, A. Chachanashvili (Yanetz), A. Khvoles, V. Felker

It should be noted that A. Khvoles was having close cooperation with his colleagues in Georgia even after emigration.

He had been taking an active part in all the scientific activities, be it International, All-union or local conferences and Symposia, enlarged session of the Seminar at our Institute, etc. In 1966 he took part in the World Congress of mathematicians.

Alexander Khvoles died on November 1, 2017 in Jerusalem at the age of 97.