

## Geologic school

Geology in its contemporary understanding is a complex science, consisting of a range of areas. In Kazan University the following scientific areas have been formed to the present time:

- mineralogy and petrography, lithology and mineral products;
- regional geology, biostratigraphy and hydrogeology;
- geology and geochemistry of oil and gas;
- geophysics.

All these areas have been formed in the faculty of geology of Kazan University in different years and now are presented by Kazan School of geologists.

The Department of Mineralogy and Geognosy formed in 1840 was divided in 1865 into two departments – the Department of Mineralogy (F.F. Rosen) and the Department of Geology (N.A. Golovkinsky). That is why the year of 1865 can be counted as the beginning of Kazan School of geologists formation with mineralogical and geologic areas.

It was historically formed that mineralogical area in Kazan University was germinated from the times of K. Fuks, V.I. Timyansky, K.I. Bronner, F.F. Rosen and others. It was preserved till our days but was differentiated in connection with the expansion of objects and methods of research: “pure” mineralogical objects were complemented by the study of various rocks and ore materials. The last thing led to the formation of petrography and lithology – the sciences about rocks consisting of minerals.

Systematic study of minerals` various peculiarities in Kazan University should be connected with the name of F.F. Rosen. During following years they were studied by A.M. Zaytsev, A.V. Lavrsky, B.K. Polenov, B.P. Krotov, L.M. Miropolsky, V.A. Polyanin, V.M.Vinokurov, I.N. Penkov, A.I. Bakhtin, N.M. Nizamutdinov and others.

In 40-70s of XX century geochemical (L.M. Miropolsky), crystallochemical and physicom mineralogical research (V.M.Vinokurov, I.N. Penkov, A.I. Bakhtin, G.A. Krinary, N.M. Nizamutdinov, G.R. Bulka, H.M. Khasanova, A.A. Galeev, V.P. Morozov, S.N. Lopatin and others) was successfully developing in mineralogical – petrographic area.

Petrographic area within Kazan geologic school was apparently began by F.F. Rosen and continued by A.M. Zaytsev, A.V. Lavrsky, B.K. Polenov, B.P.

Krotov, B.A. Uspensky, L.M. Miropolsky, B.S. Sitdikov, A.M. Dymkin, V.G. Izotov, A.N. Didenko and others.

Not only mineralogical – petrographic activity but also area now defined as lithology is connected with the name of B.P. Krotov. Lithology is a special part of petrography dedicated to secondary rocks. B.P. Krotov was one of the first in Soviet Union who began lecturing this course from 1922. Besides B.P. Krotov, such scientists as B.A. Uspensky, V.A. Polyenin, L.M. Miropolsky, V.M. Vinokurov, V.V. Korchagyn, V.G. Izotov, A.G. Nizamutdinov, R.R. Khasanov, L.M. Sitdikova and others conducted research in lithology.

Geologic area was headed by N.A. Golovinsky and successfully continued by A.A. Stuckenberg, A.V. Nechaev, P.I. Krotov, G.N. Frederiks, M.E. Yanishevsky and M.E. Noinsky. Works of abovementioned geologists laid foundation for regional-geologic, biostratigraphic and hydrogeologic research, carried out mainly in Volga-Kama basin and Western Cisurals.

Regional-geologic research after Golovinsky, Stuckenberg, Krotov, Frederiks, Yanishevsky and Noinsky was later (40-90s of XX c.) successfully continued by E.I. Tikhvinskaya, B.V. Selivanovsky, V.I. Ignatyev, I.S. Muravyev, V.I. Krupnin, B.V. Burov, O.N. Malysheva, V.S. Polyenin.

Numerous research of A.V. Nechaev, M.E. Yanishevsky, P.I. Krotov and later (40-90s of XX c.) of V.A. Cherdyntsev, M.G. Solodukha, A.K. Gusev, V.G. Khalymbadzha, V.A. Lukin, N.K. Esaulova, E.E. Sukhov, V.V. Silantyev and others is dedicated to paleontological and biostratigraphic research of Permian deposits of Ural-Volga region (predominantly traditional object of Kazan geologists).

Hydrogeologic subject established in the research of Noinsky was continued by S.G. Kashtanov, A.V. Mirtova, M.N. Sokolov, M.E. Korolev, N.N. Nelidov, I. Zharkov and others.

With the Department of Oil and Gas being singled out in 1954 as an independent one scientific research on oil subject started developing – geologic structure and oil-bearing of Paleozoic deposits of the Republic of Tatarstan and neighbouring territories, estimation of oil-bearing perspectives in insufficiently explored western regions of Tatarstan, carbonate deposits of Upper Devonian, Tournaisian stage and Vereiskian-Bashkir deposits of middle carboniferous.

For the first time in Russia the counting of natural bitumen reserves in the territory of Melekesskaya Hollow was conducted. The initiator and scientific

adviser of this research was the first Head of Department, Professor V.I. Trojepolsky; besides, significant contribution to the study of conditions of uncompensated deflections of platforms` formation, in particular, Kama-Kinel system of deflections, their role in distribution of oil-bearing was made by S.S. Ellern. The continuers of V.I. Trojepolsky and S.S. Ellern`s research were R.Kh. Muslimov, V.N. Napalkov, E.Z. Badamshin, N.P. Lebedev, R.K. Tukhvatullin, V.M. Smelkov, B.V. Uspensky.

Geophysical area within Kazan school of geologists got its real development after opening geophysical specialty in the university, first in geologic-soil faculty of the Department of Common Geology (1944), then in geologic faculty of the Department of geology, oil and geophysical methods of searching and exploring mineral products (1952).

Later in 1954 independent Department of Geophysical Methods of Searching and Exploring mineral products` field was organized (from 2003 – Department of Geophysics). So, the rich history of geophysical research in Kazan University, connected with the names of I.M. Simonov, A. Kupfer, D.I. Dubyago, V.A. Baranov, A.V. Krasnov, T.A. Banakhevich, F.M. Tsomakion, N.P. Sluginov, D.A. Goldammer, V.A. Ulyanin and many others was “legalized”.

From the other side, geologic research conducted in that time in Kazan University needed new approaches and methods, based on newest achievements of physics, chemistry and mathematics. Geophysical research methods appeared to become this very instrument of effective solution of practical tasks.

From the first years of applied geophysics` development in Kazan University the following basic research areas were singled out:

- creation of new and improvement of existing methods of downhole and field geophysical methods (G.S. Morozov, Y.A. Dickgoff, I. Lepeshinsky, V.L. Komarov, N.N. Lyashko, G.E. Yakovlev, Y.E. Korshikov, P.M. Tikhanov, F.A. Akhmadullin, R.K. Khabibullov, B.G. Chervikov, A.V. Stepanov, D.K. Nurgaliev, E.V. Utemov and others),
- research in deep structure of crust according to the data of abnormal gravitational and magnetic fields (V.P. Voronin, Z.M. Slepak, D.K. Nurgaliev, E.V. Utemov, D.I. Khasanov and others),
- magnetism of mineral products and paleomagnetism (V.P. Voronin, B.V. Burov, P.P. Petrov, P.G. Yasonov, L.V. Khalepp, D.K.

Nurgaliev, Y.P. Balabanov, Sh.Z. Ibragimov, I.Y. Zharkov, A.S. Borisov, D.I. Khasanov, I.Y. Chernova and others).

From the most significant scientific results reached in mentioned research areas the following ones can be underlined:

- development of methodology and interpretation of electric logging data (G.S. Morozov, Y.A. Dickgoff, I.Y. Lepeshinsky, V.L. Komarov, N.N. Lyashko, G.E. Yakovlev);
- development of theory, methodology and apparatus of hydrodynamic research of holes (Y.A. Dickgoff, F.A. Akhmadullin);
- creation of new highly effective methods of ore electromagnetics (Y.A. Dickgoff, R.K. Khabibullov, B.G. Chervikov);
- development of theory and methodology of field and downhole seismic exploration and acoustic logging (Y.A. Dickgoff, Y.E. Korshikov, P.M. Tikhanov, A.V. Stepanov);
- formation of geologic-physical basis for search of sedimentary cover structures by gravimetric method (V.P. Voronin, Z.M. Slepak);
- formation of magnetostratigraphic permian and triassic scale (V.P. Voronin, B.V. Burov, P.P. Petrov, P.G. Yasonov, D.K. Nurgaliev, Y.P. Balabanov, I.Y. Zharkov);
- development of technologies for paleosecular geomagnetic variations on secondary rocks research (D.K. Nurgaliev, A.S. Borisov, B.V. Burov, P.G. Yasonov, D.I. Khasanov).

Last years research in ecologic and engineering geophysics (R.K. Khabibullov, Z.M. Slepak, D.K. Nurgaliev and others), solution of geophysics` inverse problems (E.V. Utemov), deep structure of Volga-Vyatka region in connection with estimation of oil-bearing perspectives (D.K. Nurgaliev, D.I. Khasanov, E.V. Utemov, I.Y. Chernova and others) got its development. Traditional research in stratigraphy of Permian deposits is being continued with the use of newest ideas and methods – cyclostratigraphy, magnetostratigraphy, sequence-stratigraphy.