PERVOMAISKY QUARRY (CRIMEA, UKRAINE)

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All specimens:
Pervomaisky Quarry, Bakhchisarai Region, Crimea, Ukraine.

All specimens are from Fersman Mineralogical Museum RAS (FMM), V.I. Stepanov collection. Collected by V.I. Stepanov and D.V. Abramov, 1982, 1986 if not otherwise specified.

Photo: Michael B. Leybov if not otherwise specified.

A splendid collection of specimens of minerals is found at deposits which were not regarded as magnificent mineral localities. Even though these specimens are rare, such localities rapidly became famous among mineralogists and amateurs. If such findings are not repeated then the fame fades and the locality is forgotten.

In the Crimea the Pervomaisky quarry, located at the right side of the Bodrak River valley at the northern slope of the Large Kermen Mountain, 3 km East of Trudolyubovka village, Bakhchisarai district (about 22 km SSW of Simferopol), is regarded as one of these localities.

The Crimea complex exploration expedition of the *Dneprogeologiya* Trust has explored the igneous rocks of the Pervomaisky quarry (another name is the First May quarry) as raw material for crushed rock production since 1969. The *Ukrkolkhozproekt* Institute re-explored this location in 1972–1973 without proving reserves. In 1979–1982, the Crimea exploration expedition of the *Crymgeologiya* Association revaluated (down to 100 m) previous reserves for rubble and crushed rock (Khlebnikov *et al.*, 1992).

In 1971, the Bakhchisarai Quarry Authority of the *Stroyindustry* Works started excavation. Currently, the quarry is 350 x 250 m in size with depth of about 30 m. It was excavated with three benches. Since late 1990 to March, 2012, the quarry was

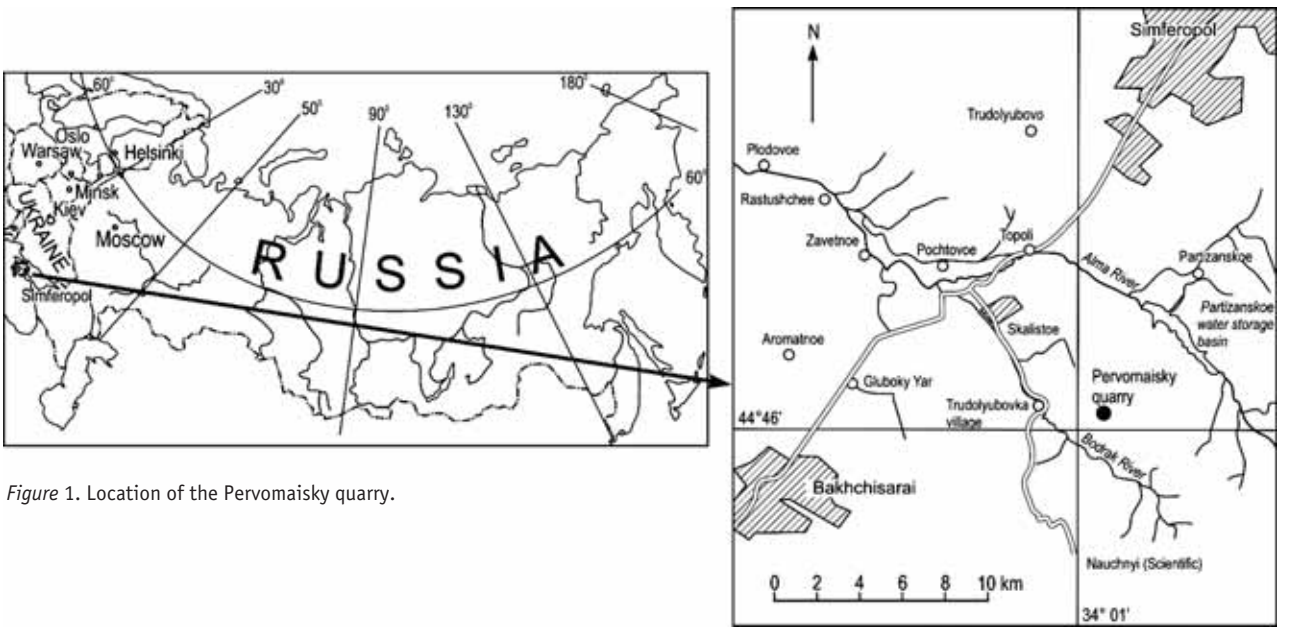

Figure 1. Location of the Pervomaisky quarry.

Figure 2. The Pervomaisky Quarry general view. Photo: A.I. Tishchenko, 2007.

closed. At present, some private businessmen have resumed hole drilling and blasting. Magmatic rocks are produced; mine rock is transported to a screening-and-crushing machine to produce crushed rock and siftings used in local building.

As a mineral locality, the Pervomaisky quarry was known where pumpellyite was described for the first time in the Crimea and where datolite was found. However, the latter ranks below datolite from Karadag Moutain, East Crimea, in perfection of crystals and quality of specimens.

In early 1980, zones with mineralized cavities were opened at the bottom of the quarry and this locality yielded splendid specimens of hydroxyapophyllite, gyrolite, and okenite. Victor I. Stepanov and Dmitrii V. Abramov from the Fersman Mineralogical Museum, Russian Academy of Sciences, collected unique mineralogical material in 1982–1984. The specimens from the Pervomaisky quarry resemble those from the famous localities of apophyllite, okenite, and accompanying minerals from basalt of Deccan, India, but rank below the latter in size and quality. Nevertheless, the specimens of hydroxyapophyllite, gyrolite, and okenite from the Pervomaisky quarry have no analogues in Ukraine and are among the best in the Former Soviet Union. Babingtonite, gmelinite, and analcime are the other interesting minerals of this locality.

Brief Geological Description

The geology and mineralogy of the Pervomaisky quarry are reported in separate publications. The geology is completely described in the book *Geology of the Kacha uplift...* (1989). Separate articles concern datolite and its association (Getling, 1960), pumpellyite (Shatagin, 1964), babingtonite (Karpenko and Ignatenko, 1991), and apophyllite (Matrosova et al., 1997). Note that all listed studies were carried out by the geologists of Moscow school that is probably caused by the closeness of the Pervomaisky quarry to the summer camp of Lomonosov Moscow State University and Russian State University of Geological Exploration (former Moscow Institute of Geological Exploration), where students of these universities have annual summer geological survey practice and this quarry is one of the ones they visit.)

The Pervomaisky quarry exposed and partially excavated the Pervomaisky (or Kushnarevsky) pluton, one of the larger bodies of the Dogger (before Late Bajocian) Pervomaisky–Ayu-Dag intrusive complex in the Crimea. The Pervomaisky–Ayu-Dag dolerite-gabbro-diorite complex comprises shallow plutons

Figure 15. Aggregate of okenite, gyrolite, and divergent crystals of **hydroxyapophyllite** colored by the inclusions of actinolite and chlorite. 4.5 x 4.5 cm. FMM, V.I. Stepanov collection #472/1.

Figure 16. Aggregate of divergent crystals of **hydroxyapophyllite** colored by the inclusions of actinolite and chlorite. 4 x 2.5 cm. Specimen: M.E. Generalov.

Figure 17. Prismatic crystals of **hydroxyapophyllite** overgrown by spherulites of **gyrolite**. 7 x 5 cm. FMM, V.I. Stepanov collection #472/1.

Figure 18. Aggregate of divergent crystals of **hydroxyapophyllite** colored by actinolite and chlorite inclusions. 7 x 4.5 cm. FMM #90862, V.I. Stepanov collection #472/1.

Figure 19. Aggregate of **hydroxyapophyllite** crystals and **okenite** spherulites. 9 x 4 cm. FMM, V.I. Stepanov collection #268/48.

Figure 20. Aggregate of **okenite, gyrolite** and cubic-shaped crystals of **hydroxyapophyllite** colored by the inclusions of actinolite and chlorite. 4.5 x 3.5 cm. FMM, V.I. Stepanov collection #472/1.

Figure 21. Crystals of **hydroxyapophyllite** with numerous inclusions of actinolite. 9 x 9.5 cm.
FMM, V.I. Stepanov collection #268/22.

Figure 29. Crystals of **analcime** with pink gmelinite. 11 x 5 cm.
FMM, V.I. Stepanov collection.

Figure 30. Aggregate of **analcime** crystals. 6.5 x 6 cm.
FMM, V.I. Stepanov collection #472/3.

Figure 31. Pink crystals of **gmelinite**. 11 x 7 cm.
FMM, V.I. Stepanov collection #472/5.

Figure 32. Tabular crystal of **gmelinite** with prehnite on quartz.
(a) Tabular crystal of **gmelinite** (0.8 x 0.8 x 0.2 cm).
(b) Specimen: 9 x 5.5 cm.
FMM, V.I. Stepanov collection #472/1.

Figure 34. Epitactic aggregate of **calcite** (numerous cube-like rhombohedra parallel overgrowing the individual of paper spar) with spherulites of **gyrolite** and crusts of **okenite** and laumontite.
9 x 6 cm.
FMM, V.I. Stepanov collection #472/2.

Gypsum is common as colorless granular aggregates rimming pseudomorphs of goethite after pyrite concretions from the Lower Cretaceous sandstone.

Conclusions

In June 2012, amateur mineral collectors from Sebastopol visited the quarry and collected new mineralogical material, including prehnite, gyrolite, okenite, hydroxyapophyllite, laumontite, and gmelinite. Thus, the mineralogical "life" of the Pervomaisky quarry goes on...

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References

Geology of the Kacha uplift in the Mountain Crimea (stratigraphy of Cenozoic, magmatic, metamorphic, and metasomatic rocks). Mazarovich, O.A. and Mileev, V.S., Eds. Lomonosov Moscow State University Press, Moscow, **1989** (in Russian).

Getling, R.V. (**1960**): Datolite from the district of the Bodrak village in the Crimea and some features of its genesis. Zap. VMO, 89(1), 12–106 (in Russian).

Karpenko, V.Yu. and Ignatenko, K.I. (**1991**): Babingtonite from the Pervomaisky quarry. // New Data on Minerals, 37, 158-163.

Matrosova, T.I., Stepanov, V.I., and Osolodkina, G.A. (**1997**): Apophyllite from the collection of the largest mineralogical museum (type of mineralization and shape of crystals and its optical parameters in relation to content of fluorine). Almanac "Among minerals", pp. 65–74 (in Russian).

Khlebnikov, A.N., Poltorakov, G.I., Beletskaya I.S., et al. (**1992**): Construction raw materials base of Ukraine. Autonomous Republic of Crimea. Kiev (in Russian).

Spiridonov, E.M., Fedorov, T.O., and Ryakhovsky, V.M. (**1990**): Magmatic rocks of the Mountain Crimea. Part 1. Bull. Moscow Soc. Natural., 65(4), 119–134 (in Russian).

Shatagin, N.N. (**1964**): Pumpellyite from the Bakhchisarai district of the Crimea. Vestn. MGU, Ser. 4, Geol., no. 4, 68–71.