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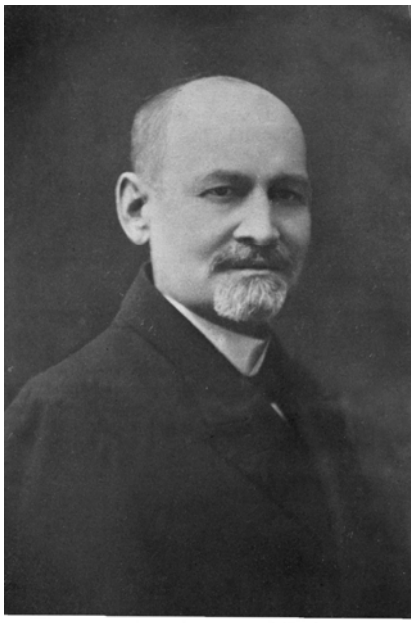
I n M e m o r i a m

Gheorghe Munteanu-Murgoci

(1872-1925)



In 2012, on the 20th of July, we celebrate the 140th anniversary of Gheorghe Munteanu-Murgoci's birthday. Gheorghe Munteanu-Murgoci is one of the most brilliant figures in the Romanian geology. He was born in 1872, in the south-eastern part of Romania, near Brăila, while his parents were moving with their sheep herds to the grazing lands. The name Munteanu was added by his teacher in the primary school. In 1895, he graduated from the University of Bucharest (Faculty of Sciences). After doctoral studies in Vienna and Munich under the supervision of professors Tschermak, Becke, Berwerth, Groth and Weinschenk, in 1900, Gheorghe Munteanu-Murgoci got his Ph.D. degree from the University of Munich. His teaching activity was shared between high school and Academia (University of Bucharest, Polytechnics School, University of Cluj). In the period 1906-1925, Gheorghe Munteanu-Murgoci played a leading role in the research activity of the Geological Institute of Romania. He was member of the Romanian Academy and of the French Academy for Agriculture, president of the International Committee of Soil Mapping (1923) and director of the Pedologic Map of Europe (1924). He died prematurely on the 5th of March, 1925.

Gheorghe Munteanu-Murgoci published more than 200 articles and books covering very diverse subjects: mineralogy and petrology, tectonics, regional geology geological mapping, geography, mineral resources, hydrogeology and pedology (e.g., Murgoci and Mrazec, 1897; Murgoci, 1901a,b, 1903, 1905a,b,c,d,e, 1906, 1910, 1911a,b, 1912a,b,c,d, 1914, 1915, 1916, 1917a,b, 1922a,b, 1923a,b,c, 1924a,b,c,d, 1925a,b, Murgoci and Osiceanu, 1908, Murgoci et al., 1925), but his most outstanding contributions are in the fields of mineralogy, tectonics and pedology.

Mineralogy. Gheorghe Munteanu-Murgoci contributed to the knowledge of the amphiboles (Murgoci, 1905d, 1906, 1922a,b), investigating the relations between the chemical composition and the optical properties of this group of minerals. Murgoci (1922a,b) published the optical characteristics of the amphibole barroisite (named after the French geologist Charles Barrois, 1851-1939), a valid IMA species.

In his Ph.D. Thesis, published in the Bulletin of the Society of Sciences of Bucharest (Murgoci, 1901), he described the pumpellyite in the Southern Carpathians, under the name "lotrite" (Coombs, 1953), giving its chemical composition and optical properties. The data on the lotrite produced by Murgoci were also published in the Bulletin de la Société Francaise de Minéralogie (Gaubert, 1901). Lotrite was subsequently identified in the greenstones from the Calaveras Valley, California (Murgoci,

1906; Eakle, 1914, page 132). However, the information on the lotrite seems not to have been spread enough and the mineral was reported as pumpellyite by Palache and Vassar (1925), a few months after Murgoci's death.

Murgoci (1903, 1925a) studied the amber deposits in Romania, showing that their chemical properties and paleogeographic conditions of formation are similar with those of the amber deposits in Scandinavian area, United Kingdom and Crimea.

Tectonics. Gheorghe Munteanu-Murgoci (1905b,c,d) described the Getic thrust nappe of the Southern Carpathians, two years after the first report of thrust nappes in the Carpathians (Lugeon, 1903, in the Western Carpathians). The cartographic outlines of the Getic front drawn by Murgoci were generally confirmed by the subsequent research.

Gheorghe Munteanu-Murgoci studied the geology of Dobrogea, with inferences on the role played by North Dobrogea in the Cimmerian orogeny (e.g., Murgoci, 1912b, 1914, 1915, 1925b).

Pedology. Gheorghe Munteanu-Murgoci contributed to the development of soils classification and mapping and investigated the influence of climate, relief and vegetation on soil composition (Murgoci, 1911a,b, 1923b, 1924a,b,c,d). He issued the first soil map of Romania (Murgoci, 1924b) and also published studies on soils from Ukraine and Turkey (Murgoci, 1924a,c).

In the extension of these very brief biographical notes, we give the translation of that part of Gheorghe Munteanu-Murgoci's Ph.D. Thesis dedicated to the characterization of the new mineral lotrite (pumpellyite), a text which was not published in English language, so far. We also add the map "Dunărea Albastră" ("Blue Danube"), presented by Gheorghe Munteanu-Murgoci at the International Geological Congress in Stockholm, in 1910, which contains the first graphical representation of the Getic Nappe.

Marian Munteanu

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The hornfelses with vesuvian and garnet from the serpentinites of the Parâng massif[1]

Gheorghe Munteanu-Murgoci

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West of the Mărghilele Cărbunelui, towards Căldarea Petresii, an interesting contact between the serpentinites and greenschists or calcschists is visible. Beside the common epidote schists and epidotites, zoisitites also were generated. Aside from outcrops, there are many blocks of rocks with epidote and zoisite (zoisite is dominant), whose aspect suggests they are enclaves in serpentinite.

The blocks show envelopes of compact chlorite, which send thin veinlets inside the reddish-whitish or greenish-grey hornfelses. The limit between the chlorite envelope and the hornfels is not sharp. Commonly, there is a gradual transition from the chlorite to a mixture of chlorite and zoisite, then to the zoisite mass. The zoisite mass is very compact, white, greenish-grey or spotted, with irregular fracture, and, in some places, it produces effervescence with hydrochloric acid (veins and nests of calcite). The white spots are monominerallic zoisite. At the microscope, the hornfels is made up of an aggregate of small zoisite columns with yellowish epidote spots and indented brown orthite grains, which, sometimes, show yellowish epidote rims.

The greenish-grey or spotted hornfelses are aggregates of clinozoisite intergrown with chlorite or with a new mineral, the *Lotrite*. The spotted aspect is given either by the greenish Lotrite, which generates

[1] Ph.D. Thesis defended at the University of Munich, in 1900, and published in 1901, with the title "Granat und Vesuvianfels aus dem Serpentin von Parîngu" in "Buletinul Societăţii de Sciinţe din Bucuresci" (Bulletin of the Society of Sciences of Bucharest), vol. 9, issues 5 and 6, p. 568-612 and 764-831.

veinlets and irregular spots in the white zoisite groundmass, or by the reddish clinozoisite, which forms veinlets and spots in the translucent greenish mass of the Lotrite.

At the microscope, the greenish mass is an aggregate of small columns and blades of a strongly refringent mineral (N = 1.67), with a distinctive cleavage parallel with the elongation. It is weakly birefringent (γ-α is maximum 0.014), the extinction angle measured to cleavage is 28º, 2E = 30º, 2V = ca. 18º, and the optical sign is positive. The plane of the optical axes is transversal to the elongation and perpendicular to the cleavage, $\gamma \parallel b$.

An analysis on a mineral separate yielded the following composition:

		Molecular ratio	
SiO_2	38.02	6.33	
Al_2O_3 }	30.90		
Fe_2O_3		0.303	
FeO	0.33		
CaO	23.56	0.421	}0.491
MgO	2.80	0.70	
LOI	6.24	0.346	
Total	101.85		

Specific gravity: 3.23. Hardness: 7.5.

Considering the analysis, this is a hydrated aluminous-calcian silicate, with the approximate formula

$4SiO_2 .2Al_2O_3(Fe_2) .3Ca(Mg)O .2H_2O.$

Characteristic for this mineral is the silica-water ratio $SiO_2 : H_2O = 2 : 1$, a ratio that does not correspond to any known aluminous-calcian hydrous silicate.

Neither its optical properties allow its identification with any of the known minerals.

Therefore, it is a new mineral, which, because of its occurrence in the valley of Lotru River, I gave the name *Lotrite.*

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The mineral that I named *Lotrite* can be found only in the compact rocks which occur as enclaves of varied size, in serpentinites, near the contact from Mărghilele Cărbunelui.

It participates, alone or with the clinozoisite, to the make-up of the hornfelses that are separated from the serpentinite by a zone of chlorite. At the margins of the enclaves, toward the chlorite envelope, the clinozoisite dominates, while the lotrite develops only toward the center of the enclave. There are very many nodules formed by clinozoisite (alone or together with chlorite), especially near the contact, where minerals such as epidote, chlorite etc are present in a higher proportion; some enclaves are made up of chlorite-epidote schists still not transformed.

The lotrite occurs as fine blades up to 15 mm in length, grey to dark green, colorless in thin sections. It has the properties already mentioned and is characterized by extinction angle of 28° and weak birefringence (β-α) of ca. 0.002. The angle of the optical axes is small (2V maximum 20°), with positive optical sign. In some respects, the lotrite resembles the prehnite, but differs from it by the higher

refringence and lower birefringence (N = 1.67; γ-α maximum 0,014); the density and hardness of the lotrite are much greater; moreover, the chemical composition indicates it is different from the prehnite.

Lately, I performed a new analysis on a higher-purity separate, which yielded the following composition:

SiO_2	39.44	
Al_2O_3	28.33	Includes Fe_2O_3
CaO	22.21	
MgO	3.20	
Na_2O	0.93	
H_2O	6.58	
Total	100.69	

Specific gravity: 2.229.

This analysis does not show great difference from the one presented earlier, therefore, the formula $4SiO_2$.$2Al_2O_3(Fe_2)$ .3Ca(Mg)O .$2H_2O$, determined initially, seems to be correct. The *Chlorastrolite*, very similar to the lotrite from the chemical point of view, proved to be an impure prehnite.

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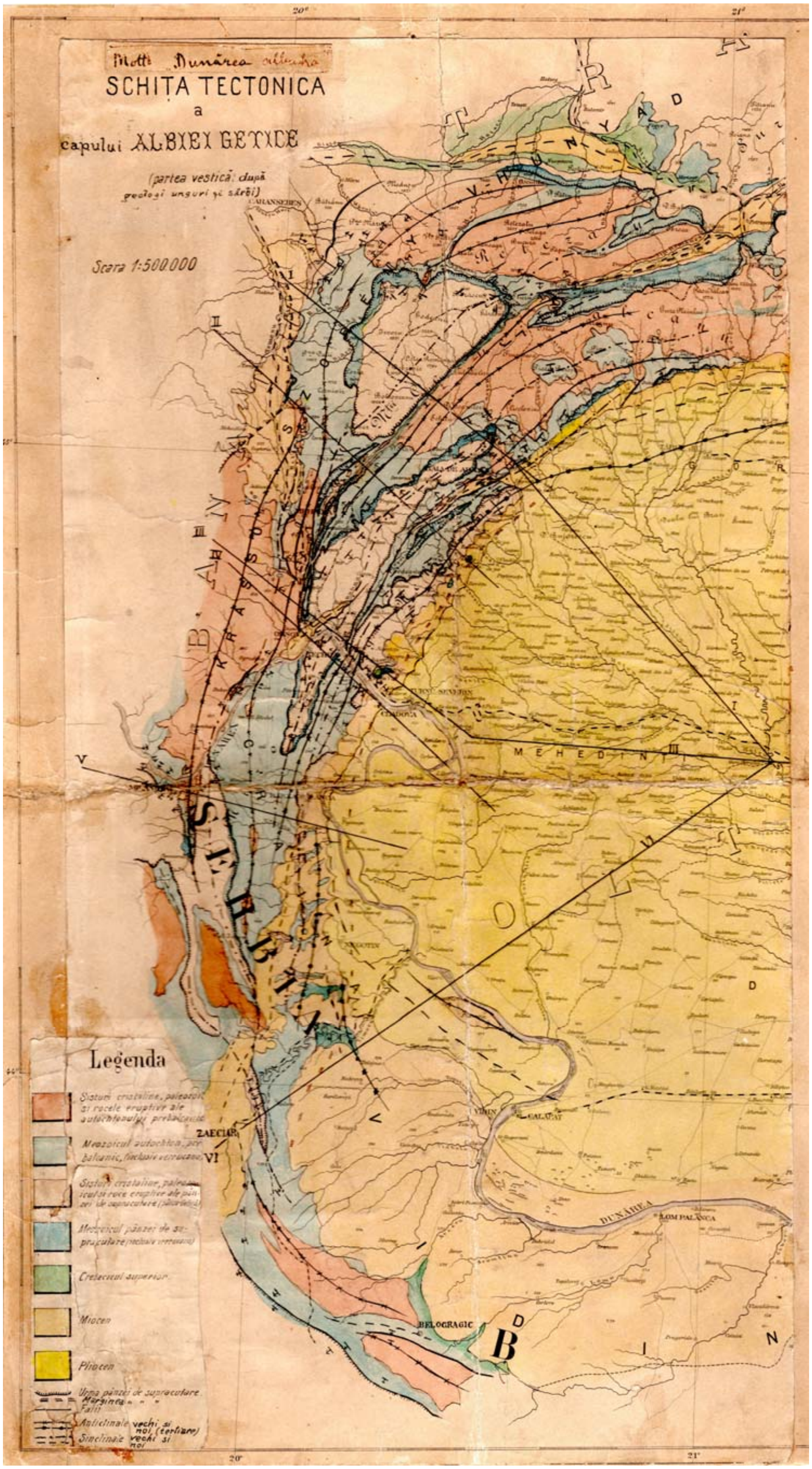
The tectonic sketch map "Dunărea Albastră" ("Blue Danube"), containing the first graphical representation of the Getic Nappe. The map was presented at the International Geological Congress in Stockholm, in 1910. The original map is kept at the University Politehnica of Bucharest, Faculty of Material Science and Engineering. By courtesy of Dr. Mircea Ionuţ Petrescu, Vice Dean of the Faculty of Material Science and Engineering.


SCHIȚA TECTONICA
a
capului ALBIEI GETICE
(partea vestică: după geologi unguri și sârbi)
Scara 1:500.000
Legenda
Cretaceul superior
Miocen
Pliocen
Urma pânzei de supracutare
Marginea " "
Falii
Anticlinale vechi și noi (terțiare)
Sinclinale vechi și noi
MEHEDINȚI
DUNĂREA
LOM PALANCA
BELOGRAGIC
ZAECIAR
CALAFAT