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ON THE STATUS OF IMPLEMENTATION OF PLANNED AND STARTED BY YEVHEN LAZARENKO SCIENTIFIC WORKS ON MINERALOGY OF UKRAINE AND THE CARPATHIAN-BALKAN MOUNTAIN SYSTEM

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The state of implementation of the conceived and initiated by Yevhen Lazarenko scientific works on mineralogy of Ukraine and the Carpathian-Balkan mountain system has been analysed. The results of research on the topic "Mineralogy of the Ukrainian SSR (1978) are presented, as well as the following regional mineralogical works on the territory of the country. The plans of the scientist concerning mineralogical reports on mineralogy of Ukraine have been partially implemented during long work on the preparation of "Mineralogical Encyclopaedia of Ukraine". The work on the summary of mineralogy of the Carpathian region has been completed – during 1990–2014 five books of the series "The Minerals of the Ukrainian Carpathians" have been published. And the book "Minerals of the Carpathians" has been published in 2002 in Prague. It contains the first published synthesis description of the minerals discovered in the Carpathian region as well as the features of the major mineral objects of individual countries participating in the Carpathian-Balkan Geological Association. This work confirms a partial implementation of Yevhen Lazarenko's plans regarding the creation of the mineralogical encyclopaedia of Carpathian-Balkan mountain system.

Key words: Yevhen Lazarenko, mineralogy of Ukraine, mineralogy of the Ukrainian Carpathians, the encyclopaedia of mineralogy, mineralogical dictionary.

Yevhen Lazarenko planned the creation of a monographic summary on mineralogy of Ukraine and mineralogical dictionary-digest of Carpathian-Balkan mountain system in the second half of the twentieth century during the Lviv period of life and creativity. The idea first appeared after the appearance of three monographs on mineralogy of the three Ukrainian regions – igneous complexes of the Western Volyn [29], sedimentary rocks of the Precarpathians [11] and different geological rocks of the Transcarpathians [19]. These books have been highly appreciated by the geological community. They confirmed the importance of the regional mineralogical investigations of both theoretical and applied view. These works showed the following: regional mineralogical studies provide the key to decrypt the geological history and the physical and chemical changes of minerals and mineral associations, due to which this history can be restored. Such studies are one of the main preconditions for forecasting, prospecting and evaluation of mineral deposits; they are the source of comprehensive informa-

tion on minerals on the basis of which the scientists develop mineralogical theories and laws.

Regional mineralogical researches are closely related to the doctrine of typomorphism of minerals, which plays an important role in clarifying the context of the constitution and properties of minerals with the conditions of their formation and in the solution of some applied problems. At that time, particularly regional mineralogical researches and study of typomorphism of minerals started to purchase special value for Ukraine, because the almost complete section of the Earth's crust presents on its territory, almost all the major geological structures of the European continent are available as well as rocks and mineral deposits, diverse in age and composition. By that time, there were many scientific papers devoted to the geology of Ukraine. However, many aspects of the geological structure, magmatism, lithogenesis, metamorphism, ore genesis and prospects of ore content were unresolved or controversial. The results of the first synthesis regional mineralogical studies of the three regions of Ukraine showed that mineralogical data are of great importance in order to solve these issues. That's why Ukrainian mineralogists started at the end of 1960-ies the implementation of important long-term research topics of national importance "Mineralogy of Ukraine".

Initially it was assumed that the main purpose of this theme will be the creation of a monographic mineralogical description of the mineral deposits and rocks of Ukraine. However, in 1969, the initiator of the theme and its first supervisor Yevhen Lazarenko moved to Kiev, and two performers of the theme – Oksana Vynar and Pavlo Vovk – switched in 1970-ies from the University to another job, so the scope of research was limited. The main focus was on (*a*) detailed study of individual rock-forming, accessory and ore-forming minerals, (*b*) mineralogy of some practically interesting geological objects, and (*c*) mineralogy of celestial objects – meteorites.

Mineralogists of the Lviv University performed work in close collaboration with a number of industrial geological organizations (Zakarpatska, Lvivska, Pravoberezhna, Voroshylovhradska Exploration Expeditions and mine "Volynskyi", on the basis of which the Unity "Zahidkvartssamotsvity" ("West-Quartz-Gems") was created) and research institutions of the Academy of Sciences of the Ukrainian SSR (Institute of Geological Sciences, Institute of Geochemistry and Physics of Minerals, Institute of Geology and Geochemistry of Combustible Minerals) and the Ministry of Geology of the Ukrainian SSR (Institute of Mineral Resources).

The main research results during the first five years (with guidance and participation of Yevhen Lazarenko) is described in numerous scientific articles and summarized in five monographs, devoted to the mineralogy of Podillya [10], mineralogy and petrography of the Chyvchyny Mountains in the Ukrainian Carpathians [17], mineral-forming fluids and parageneses of minerals in the pegmatites of so-called pocket type [31], lithogenesis of the Precarpathians sulphur deposits [12] and mineralogy and genesis of Volynian chamber pegmatites [20].

The research results of the following five years are presented in numerous papers and summarized in today forgotten scientific report on the theme "Mineralogy of the Ukrainian SSR" (Lviv, 1978), which is stored in the collections of the Mineralogy Department and the scientific library of Lviv University. Top performers of the theme and writing the report: Professor, head of Mineralogy Department Orest Matkovskyi

(scientific supervisor), senior researcher Ulyana Fenoshyn (executive in charge of the research), Professor, head of the Petrography Department Oleksandr Bobriyevych, Associate Professors of the Mineralogy Department Zbigniew Bartoszynski and Anhelina Yasynska, Associate Professor of the Petrography Department Vitaliy Khmelivskyi, senior researcher Eduard Yanchuk, assistants of the Petrography Department Claudia Kalyuzhna and Eugene Rybachok. Also engineering and technical personnel takes part in the researches and writing of the report: head of laboratory Vasyl Makarov, head of the cabinet Marilena Hotyeyenkova, senior engineer Natalia Razumyeyeva, engineer Vira Sokolova, senior laboratory assistants Liliya Bon' and Volodymyr Stepanov.

The scientific report contains introduction, analytical review, justification of work, eight chapters, conclusions, list of references. Such topics have been analyzed in the report on the basis of a large factual material, mostly private, as well as literary: (*a*) typomorphism of native gold, carbonado-like diamond, baddeleyite, columbite and garnets, (*b*) monograph synthesis of glauconite, (*c*) mineralogy of Burshtyn manganese deposit, (*d*) metasomatic processes in pocket pegmatites of Volyn region, and in the Upper-Buh fault zone of the Ukrainian shield, (*e*) mineralogical characteristic of meteorites that fell on the Ukrainian territory.

In the section "Typomorfism of Carpathian Gold", Orest Matkovskyi and Anhelina Yasynska described in sufficient detail the chemical composition, morphology and physical properties of native gold from the native gold mineralization of the Alpine and Late Alpine time and placer mineralization – ancient (Soymulski and Slobidski conglomerates) and Quaternary. The possible indigenous sources of alluvial gold have been proposed and its genesis has been identified. Impressive are the data about the structure (anatomy) of gold, based on precision, unique at that time, electron microscopic studies (Fig. 1, 2), as well as numerous definitions of absolute hardness value of the mineral. These data indicate the heterogeneity of the internal structure and composition of native gold. The most informative typomorphic characteristics of gold are its morphology, gold fineness, trace elements, some physical properties and mineral associations.

The results of native gold research are given in numerous articles, partly – in the second part of the monograph "Geology and Useful Minerals of the Ukrainian Carpathians" [2] and almost entirely – in the first book of the series "Minerals of the Ukrainian Carpathians" – "Simple Substances, Tellurides and Sulphides" [24].

In the section "Some Typomorphic Features of Carbonado-like Diamonds and Baddeleyite From Titanium-bearing Placers and Columbite From Carbonatites", Zbigniew Bartoszynski presented the results of joint research with scientists of the Institute of Mineral Resources. These data are partly presented in the articles "Electron Microscopic Study of Flattened, Heavily Deformed Diamonds From Placers of Ukraine" [1]; "Baddeleyite From Titanium-bearing Placers" [34] and "Typomorphic Features of Columbite" [14].

Electronic-microscopic study of deformed and flat polycrystalline diamonds from placers attracts the attention. Diamonds are composed of identical crystallites, which can be different polymorphic modifications of carbon. They may be of shock-metamorphic origin.

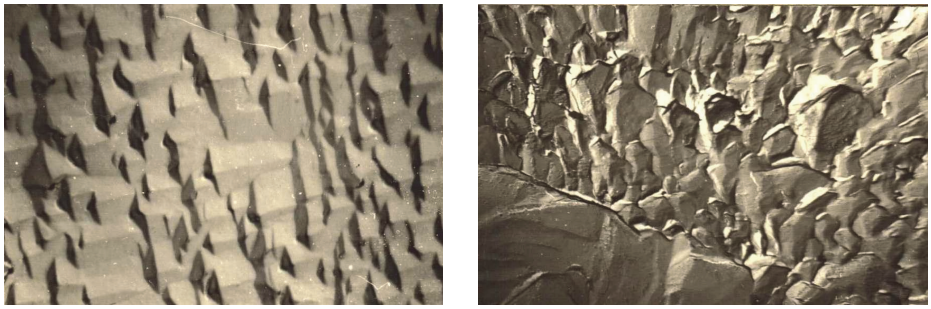

Fig. 1. Electron microscopic images of placer gold etching surface (Slobidski conglomerates); × 15 000 (according to V. Makarov, 1978).

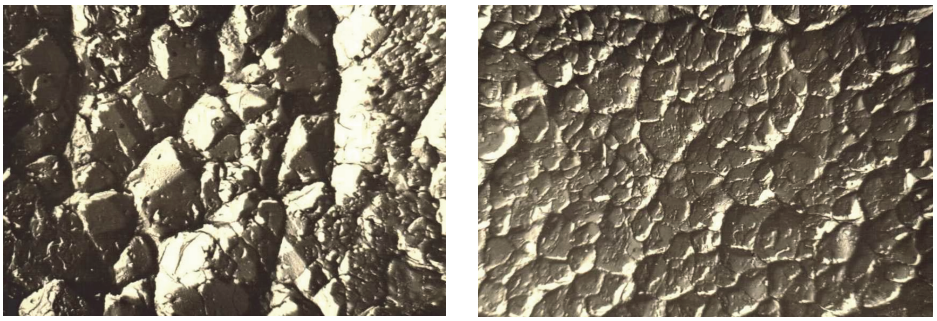

Fig. 2. Electron microscopic images of placer gold etching surface (alluvial deposits of the Lyuchka-river basin); × 15 000 (according to V. Makarov, 1978).

The results of goniometric investigations of baddeleyite and columbite are of great importance. Baddeleyite grains only from alluvium of Irsha-river (Zhytomyr region) were suitable for goniometric study. It was found that habit faces on the crystals are presented by pinacoids {100}, {010}, {001} and rhombic prisms {110} and {011}. Four morphological types of crystals have been identified according to the degree of development of the separate simple forms. Also the chemical composition, structure and physical properties of baddeleyite have been investigated. According to these data, the primary genesis and age of the mineral can be different.

Thirty one simple forms have been found on columbite crystals, most of them have been discovered for the first time. Also the unit cell parameters, infrared spectra and chemical composition of the mineral have been studied. Data from these studies of columbite are given in the monograph "Mineralogy of the Azov Region" [22], however, there is no picture of crystal in it, and it is quite specific, although represented by only an apical part (Fig. 3).

The next section of the report, "Typomorphism of Garnets", contains the characteristic of pyrope garnets from Volyno-Podillya and Azov regions (by Oleksandr Bobriyevych) and almandine-spessartine garnets from the Carpathian region (by Orest Matkovskyi). Almandine-spessartine garnets are described in sufficient detail in some scientific articles, and in the fourth book of the series "Minerals of the Ukrainian Carpathians" – "Silicates" [28]. Some publications are devoted also to pyrope garnets, but, unfortunately, there are no generalizing works.

Described report contains the synthesis by pyrope garnets of Ukraine performed for the first time. Pyrope garnets from terrigenous rocks of different age, from breccias of Volyno-Podillya region, sandstones of the Azov region and some indigenous rocks have been investigated. Places of finds of garnets are described, and grain size, their colour, index of refraction, unit cell parameters, density, chemical composition and content of minals are characterized. The conclusions of practical importance have been made: on the territory of Ukraine, particularly in Volyn and Azov regions, low-Cr pyrope (up to 5 % Cr_2O_3) is common, and its composition fully complies with low-Cr pyrope from Yakut kimberlites. Also high-Cr pyrope with knorringite minal (8–14 % Cr_2O_3) has been found there in a small quantity, as well as garnets of grossular-almandine-pyrope composition close to the composition of garnets from xenoliths of eclogites in Yakut kimberlites.

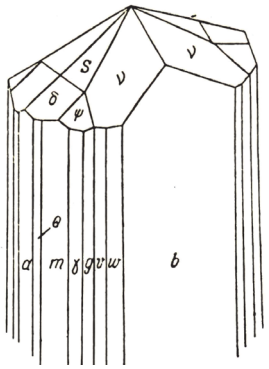

Fig. 3. The habit of columbite crystals from carbonatites of Azov region – idealized model of half of the crystal based on gnomostereographic projection (according to Z. Bartoszynski, 1978).

The existence of pyrope in ultrabasic alkaline rocks of platform type has been proved for the first time for Ukraine.

Almost monographic section "Glauconite, Its Composition, Structure and Properties" (by Ulyana Fenoshyn) is the largest by volume. It contains four subsections: 1 – the state of knowledge of glauconite; 2 – mineral distribution in different age sediments of the Volyno-Podillya, the Dnieper-Donets basin, the Carpathian mountains and Crimea; 3 – typomorphic features of glauconite; 4 – genesis of glauconite and prospects of its use. The results of these studies have only partially been covered in numerous articles, and the first synthesis of glauconite from different Ukrainian regions has been made in the report. It is based mainly on own thorough mineralogical studies of the chemical composition of the mineral, its structure, physical and physicochemical properties and on the critical analysis of data received by predecessors. Granular glauconite is the most common, it structurally relates to mixed-layered formations, composed of unsettled intercalation of montmorillonite and micaceous layers. The number of montmorillonitic layers (layers that swell) in this glauconite varies widely – from 5 to 20 %, which leads to variability in the morphology and physical properties of the mineral.

Extremely important are the data about the practical use of glauconite. The conclusion emphasises the suitability of glauconitic sands or its concentrates for the production of volumetric-coloured cellular silicate concrete and brick, coloured slate, cement, plaster, very efficient adsorbents of radioactive isotopes of Co, Sr, Cs and surfactants. The ability to use of glauconite flour as a stimulator of growth and yield of buckwheat, barley, winter wheat, corn, etc is proven. Feasibility study on one of the most promising territories has been performed, and the estimated reserves of 230 million tonnes of glauconite have been determined. According to preliminary data, on this site it is possible to construct ore mining and processing enterprise with the annually capacity 90–540 thousand tonnes of ore and 50–200 thousand tons of concentrate.

Closest to a monograph is the section "Minerals of Manganese of Burshtyn Deposit" (by Vitaliy Hmelivskyi and Eduard Yanchuk), which consists of four subsections. The geological-genetic features of the deposit are described, as well as petrographic and petrochemical characteristic of manganese-bearing rocks. Mineralogy of manganese carbonates and minerals of oxidized manganese ores have been studied. It has been shown according to chemical, X-ray and thermal studies, that the main mineral of carbonate manganese ores is the manganocalcite, occasionally rhodochrosite, also kutnahorite is possible; oxidized ores contain birnessite, and rancieite and todorokite are rarely available. The results of these studies were covered in numerous articles, partly in the monograph "Manganese Ores of Ukraine" [13] as well as in the prepared by Eduard Yanchuk doctoral thesis "Mineralogy of Manganese in the Carbonate Manganese Ores Deposits Oxidized Zone" [37]. Unfortunately, premature death prevented the execution of the plans.

The sixth section "Metasomatic Mineral Formation in the Chamber Pegmatites and in the Precontact Zone of Host Rocks" (by Claudia Kalyuzhna) contains two subsections: 1 – feldspathic metasomatic rocks in pegmatites; 2 – sectorial twinning of plagioclase from gabbro-syenites. In the first subsection, differently manifested metasomatic changes in pegmatites have been analyzed. The formation of two types of metasomatites has been connected with these changes: the most intensively manifested albite metasomatic rocks (albitizated pegmatites) and common potash feldspar metasomatic rocks (K-feldspathic pegmatites). Interesting and important is the first discovered in these pegmatites mineral – celadonite, which fills the cavities in quartz and K-feldspar and develops as a secondary mineral by biotite and K-feldspar. The second subsection is devoted to the rather peculiar sectorial twinning of plagioclase from a hybrid rock, formed on the contact of granites and mafic rocks. The researcher determined the number of plagioclase and twinning laws.

In the seventh section, "The Peculiarities of Mineralogy of the Upper-Buh Fault Zone Rocks" Eugene Rybachok characterized quantitatively the mineral composition of red micaceous gneissous granites, garnet-micaceous and sillimanite-micaceous with garnet Chudnovo-Berdychivski granites, migmatites by charnockitic and Chudnovo-Berdychivski granitoids, garnet-micaceous tektonites. Rock-forming minerals – feldspar, mica, garnet, sillimanite and cordierite – are briefly described. Accessory minerals are represented by zircon, monazite, apatite, titanite, ore minerals – by molybdenite and antimonite.

The final, eighth section "Mineralogy of Meteorites" (by Anhelina Yasynska) contains four subsections: 1 – the structural features of meteorites; 2 – mineral composition of meteorites; 3 – characteristics of new meteorites; 4 – some contemporary issues of cosmic mineralogy. Scientist studied the composition and properties of minerals from meteorites that fell on the territory of Ukraine (*Richky*, *Knyahynya*, *Chervonyi Kut*, *Yurtuk*). The mineralogical characterization of new meteorites is presented for the first time – *Andrijivka* and *Horlivka*. The researcher suggested genetic classification of inclusions in minerals of meteorites and lunar rocks. She analyzed a number of modern aspects of cosmic mineralogy: signs of shock metamorphism and their classification; patterns of distribution of chemical elements in glasses and crystals of the chondrule-forming minerals; the similarities and differences of shock metamorphism in

terrestrial, meteoritic and lunar minerals. The results of these studies are published in numerous papers.

The important conclusions are presented at the end of the report. It is proved on the example of certain minerals and regions that the results of the regional mineralogical research and especially research of minerals' typomorphism are important indicators of genetic information. They can be used during the exploration and quantification of mineral resources. Typomorphic features for a number of minerals play a crucial role in the quality assessment of mineral raw materials.

The idea of creating a summary on mineralogy of Ukraine Yevhen Lazarenko embodied in Kyiv. At the Institute of Geological Sciences, which he chaired, the Department of Regional and Genetic Mineralogy was created. The scientist together with a group of young researchers (mainly graduates of Geological Faculty of the Lviv University) led an active regional mineralogical research in such important industrial regions of Ukraine, as Donbas, Kryvyi Rih and Azov regions. Within a relatively short time, new monographic reports on the editorship and authorship of Ye. Lazarenko appeared: "Mineralogy of the Donets Basin" [8, 9] "Mineralogy of the Kryvyi Rih Basin [21] and "Mineralogy of the Azov Region" [22]. These books have received high praise by famous Russian mineralogists – professor Anatoly Ginzburg [3] and the Russian academician Nikolai Yushkin [38]. They noted that in 60–80-ies of XX century in the former USSR there was well-known Lviv-Kyiv regional mineralogical school of Yevhen Lazarenko, which conducted a systematic study of the minerals of Ukraine. Therefore, the Ukrainian shield, the Carpathians, the Donbas, Crimea, i.e., all of Ukraine, became the most thoroughly mineralogically studied region of the USSR. Topomineralogical data for selected geological regions of Ukraine are summarized in a series of very detailed books that are regularly published under the leadership of Lazarenko [38].

Serious illness and premature death of Yevhen Lazarenko in 1979 prevented his true intent concerning publication of monographic reports on mineralogy of Ukraine. However, this idea did not remain without attention of his disciples and followers. With their active participation in the 1990 the book "Minerals of Ukraine: Brief Guide" (edited by academician Mykola Shcherbak) has been published [25]. Data on minerals of Ukraine, available at that time, are very briefly summarizes in it. The Handbook also analyzes the minerals that have been discovered in Ukraine, and then interpretation is given. The following categories of minerals have been distinguished:

- new mineral species and varieties;
- recommended to be excluded from the mineralogical nomenclature;
- understudied and therefore not well justified as new;
- those that have earned the right of synonyms;
- minerals-mixtures, which were previously considered or provided new;
- anticipated new minerals;
- unnamed poorly understood.

The book states that at the beginning of 1988 about 680 mineral species and varieties have been determined in the rocks of Ukraine with different level of reliability, including about 70 minerals that are diagnosed inaccurate, insufficient or unreliable.

The intent of the acad. Ye. Lazarenko has changed somewhat during the years of Ukraine's independence, in the early twenty-first century. Volodymyr Pavlyshyn initiated the preparation of the encyclopaedic edition of mineralogy of Ukraine, which was discussed during the life of the academician. Volodymyr Pavlyshyn, the then President of the Ukrainian Mineralogical Society, initiated in 2001 (with the support of Stanislav Dovhyi and the assistance of a number of Ukrainian state and public organizations) the preparation of the five-volume edition "Mineralogical Encyclopaedia of Ukraine" (MEU). The editorial board of MEU, headed by S. Dovhyi (editor), V. Pavlyshyn (scientific editor) and O. Zinchenko (executive secretary), and even the editorial boards of the individual volumes have been established. It all began with the creation of database on minerals of Ukraine. On their basis, V. Pavlyshyn prepared to discuss the dictionary of MEU (Kyiv, 2001, manuscript) – it was a list of about a thousand terms that are scheduled to be placed in the encyclopaedia. The editorial board has developed a scheme of descriptions of the articles. And the completion of the preparation of the first volume was nearing. However, due to inertia and irresponsibility of some authors and financial difficulties the publication was frozen.

But the initiators of this edition are still actively working; they collect new information and generalize it. Evidence of this are publications on new minerals of Ukraine [4], the mineral kingdom of Ukraine [32], the general features of the mineral composition of the Ukrainian geological formations [33], the database and the chronology of the discovery of minerals in the Ukrainian bowels [5, 6], mineralogy of Ukraine in the context of mineralogy of the world [7].

V. Pavlyhyn, S. Dovhyi, and O. Zinchenko adapted own and literature data, as well as the materials obtained from the Ukrainian mineralogists. On this basis, they drew up the inventory of minerals of Ukraine, which in late 2006 had nearly 1 200 titles. The researchers classified them in accordance with mineralogical classification of Karl Hugo Strunz (version dated 10.07.2006, website Webmineral.com) following the recommendations of the International Mineralogical Association (IMA) regarding the separation of minerals in mineral species and varieties, discredited or approved by the Commission on new minerals and mineral names of the IMA. Among well-known in Ukraine minerals there were 894 mineral species, approved by the IMA. The amount of minerals, discovered in Ukraine, but not approved as a separate species was 51, the amount of varieties of mineral species – 252. The researchers compared the relative distribution of mineral classes in the Earth's crust and in Ukraine [32]. These data have been included in published in 2009 textbook "Fundamentals of Mineralogy of Ukraine" (authors O. Matkovskyi, V. Pavlyshyn, Ye. Slyvko) [18]; it actually became the first monographic summary of mineralogy of Ukraine. Of course, the authors comparatively briefly described in the textbook only the most common and important minerals, as is required by the educational process.

In early 2012 the database of the minerals of Ukraine (DBMU) already contained 963 names of minerals that are approved by IMA as an independent mineral species. About 100 different minerals and phases found in DBMU as such, known in Ukraine, however, have no certain status. Some of them with different status (not approved by IMA, group names, intermediate names of isomorphous series, etc.) are included in the modern international databases – MinDat, Mineralogy Database, etc. [6].

Recently the scientists of M. P. Semenenko Institute of Geochemistry, Mineralogy and Ore Formation of NASU, headed by academician Oleksandr Ponomarenko, actively work on the creation of MEU. This is evidenced by two recent publications in "Mineralogical Journal" (Ukraine), which relate to the regulation of the nomenclature and Ukrainian names of mineral species in connection with the preparation of the "Mineralogical Encyclopaedia of Ukraine". In the first publication, Oleksandr Ponomarenko and Hanna Kulchytska noted that, despite all the troubles of today, the number of known in Ukraine minerals is growing steadily and now reaches about 1 000. However, not all minerals described in the national literature, have been approved by special commissions of IMA as a separate mineral species. Therefore, when preparing MEU, it is necessary to determine again the well-known in Ukraine minerals in accordance with changes in the nomenclature of their groups [35]. In the second publication the authors – Oleksandr Ponomarenko, Hanna Kulchytska and Darya Chernysh – noted that the unification of Ukrainian names of the minerals is also important during the preparation of the encyclopaedia. It is indispensable for the creation of electronic databases of minerals, search engines and automated processing of information [36]. Thus, the preparation of the encyclopaedia has moved, and it is hoped that the book will be published.

In a little better condition (though not in this form, as it was planned) is another idea of Yevhen Lazarenko – the creation of "Mineralogical Encyclopaedia of Carpathian-Balkan Mountain System". First, it should be a mineralogical dictionary. Yevhen Lazarenko initiated its preparation at the first meeting of the Commission of Mineralogy and Geochemistry of the Carpathian-Balkan Geological Association (CBGA), which took place at Lviv University in 1961. The scientist gave examples of descriptions of all components of the dictionary [15], and the representatives of the countries participating in CBGA supported this idea. The third session of the Commission (Kyiv, 1975) have decided to call this guide "Mineralogical Encyclopaedia of Carpathian-Balkan Mountain System". Yevhen Lazarenko prepared the principles of compiling and the final layout of the encyclopaedia; they were cited in the published materials of this meeting [16]. However, according to the known reasons, this plan was not implemented. Instead, it was decided first to prepare and publish mineralogical reports for individual countries, due to different mineralogical study of individual regions of the countries participating in CBGA.

In Ukraine, the preparation of such report was begun by the followers of Yevhen Lazarenko, mostly his former students. Now all the information on mineralogy of the Ukrainian Carpathians is completed –five books of the series "Minerals of the Ukrainian Carpathians" have been published. The first book of the series – "Simple Substances, Tellurides and Sulphides" [24] was published in 1990, the second – "Oxides, Hydroxides, Fluorides, Chlorides and Iodides" [23] – in 1995, the third – "Borates, Arsenates, Phosphates, Molybdates, Sulphates, Carbonates, Organic and Colloid Minerals" [26] – in 2003, the fourth – "Silicates" [28] – in 2011, the fifth – "Processes of Mineral Formation" [27] – in 2014.

In the epilogue of the fifth book [27] and in the special publication [30], the researchers briefly reviewed the status and future perspectives of mineralogical studies in the Ukrainian Carpathians. Significant prospects for further studies of the mineralogy of the region associate with using the latest modern methods of mineral substance

analyzing. On special attention deserve, first of all, currently the least known products of hypergenesis, technogenesis and contemporary mineral formation. The greatest prospects for the discovery of minerals, not previously known in the region, including new, are connected today primarily with them.

The book "Minerals of the Carpathians" [39] was printed in Prague in 2002; it contains the general description of minerals, discovered in the Carpathian region, and characteristic of the most important mineral objects from individual countries-members of CBGA. This work was partially developed the idea of Yevhen Lazarenko about mineralogical encyclopaedia of Carpathian-Balkan mountain system.

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ПРО СТАН РЕАЛІЗАЦІЇ ЗАДУМАНИХ І РОЗПОЧАТИХ ЄВГЕНОМ ЛАЗАРЕНКОМ НАУКОВИХ ПРАЦЬ З МІНЕРАЛОГІЇ УКРАЇНИ ТА КАРПАТО-БАЛКАНСЬКОЇ ГІРСЬКОЇ СИСТЕМИ

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Проаналізовано стан реалізації задуманих і розпочатих Євгеном Лазаренком наукових праць з мінералогії України та Карпато-Балканської гірської системи. Висвітлено результати досліджень за темою "Мінералогія Української РСР" (1978), а також наступних регіонально-мінералогічних робіт на території країни.

Плани Є. Лазаренка стосовно мінералогічного зведення з мінералогії України частково реалізовано під час тривалої роботи над підготовкою "Мінералогічної енциклопедії України". Свідченням цього є публікація таких видань, як "Минералы Украины. Краткий справочник" за редакцією акад. М. Щербака (1990), "Основи мінералогії України" О. Матковського, В. Павлишина та Є. Сливко (2009), а також численних статей мінералогічного спрямування у вітчизняних і зарубіжних журналах.

Завершено роботу над зведенням з мінералогії Карпатського регіону – протягом 1990–2014 рр. опубліковано п'ять книг з циклу "Мінерали Українських Карпат". У 2002 р. у Празі вийшла друком книга "Minerals of the Carpathians", у якій уперше наведено узагальнений опис мінералів, виявлених у Карпатському регіоні, та схарактеризовано найважливіші мінеральні об'єкти окремих країн-учасниць Карпато-Балканської геологічної асоціації. Цією працею частково реалізовано задум Євгена Лазаренка щодо мінералогічної енциклопедії Карпато-Балканської гірської системи.

Ключові слова: Євген Лазаренко, мінералогія України, мінералогія Українських Карпат, мінералогічна енциклопедія, мінералогічний словник.