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DIGEST



MINING HERITAGE: LEN SHALYGIN

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Abstract

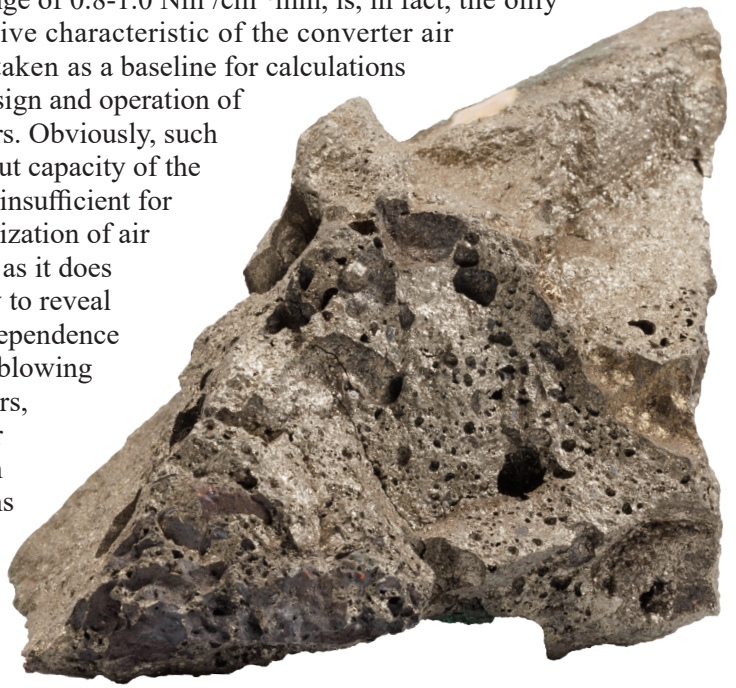
The digest has been prepared for the scientific readings "Mining Heritage: Len Shalygin," dedicated to the memory of Len Shalygin, a lecturer and scholar of the Saint Petersburg Mining Institute. The collection includes his articles from the Journal of Mining Institute: works on aerodynamics and the blast regime of converters, blast utilization, and the motion and mixing of slag melts (1956–2006), as well as historical-scientific publications on the development of mining and metallurgical science and the scientific schools of the Mining Institute (1995–2005).

Taken together, the materials of the digest reflect the breadth of L.M. Shalygin's scientific interests—from fundamental problems of converter processing to the history of Russian mining science—and demonstrate the continuity of the traditions of the Petersburg mining and metallurgical school.

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Shalygin L.M. On air supply to the converter // Journal of Mining Institute. 1956. Vol. 32. Iss. 3. P. 317-326. https://pmi.spmi.ru/pmi/article/view/14990

Abstract. Air supply to the converter is one of the determining characteristics of its operation. The productivity of converters under any conditions is ultimately determined by the amount of air blown in through the tuyere. Meanwhile, the question about the regularities of air blowing in relation to converters of non-ferrous metallurgy in modern literature is poorly covered. Many practical issus of converters operation are still unclear. For example, there are completely different opinions on the rational diameter of tuyere, there is no definite opinion on the angle of their inclination, cleaning mode and, most importantly, there is no any justification of the value of the so-called throughput capacity of tuyere, per 1 cm^2 of cross-section. This throughput, conditionally recommended by practical data in the range of 0.8-1.0 $Nm^3/cm^2 \cdot min$, is, in fact, the only quantitative characteristic of the converter air regime, taken as a baseline for calculations in the design and operation of converters. Obviously, such throughput capacity of the tuyere is insufficient for characterization of air blowing, as it does not allow to reveal mutual dependence of many blowing parameters, converter operation conditions and other factors.



Converter matte. From the collection of the Mining Museum

Shalygin L.M. Aerodynamics of a horizontal converter // Journal of Mining Institute. 1975. Vol. 55. Iss. 3. P. 117-125. https://pmi.spmi.ru/pmi/article/view/11481

Abstract. The horizontal converter, which has become widespread in the metallurgy of copper and nickel, belongs to the metallurgical units in which the conditions of blast supply play a decisive role. The existing limit of the converters' air load, which restricts their productivity, can be significantly exceeded. Work in this direction continues at the Furnace Department of the LGI.



Nickel ore,
Verkhny Ufalei.
From the collection
of the Mining Museum



Rich copper-nickel ore.
Severonickel Combine.
From the collection
of the Mining Museum



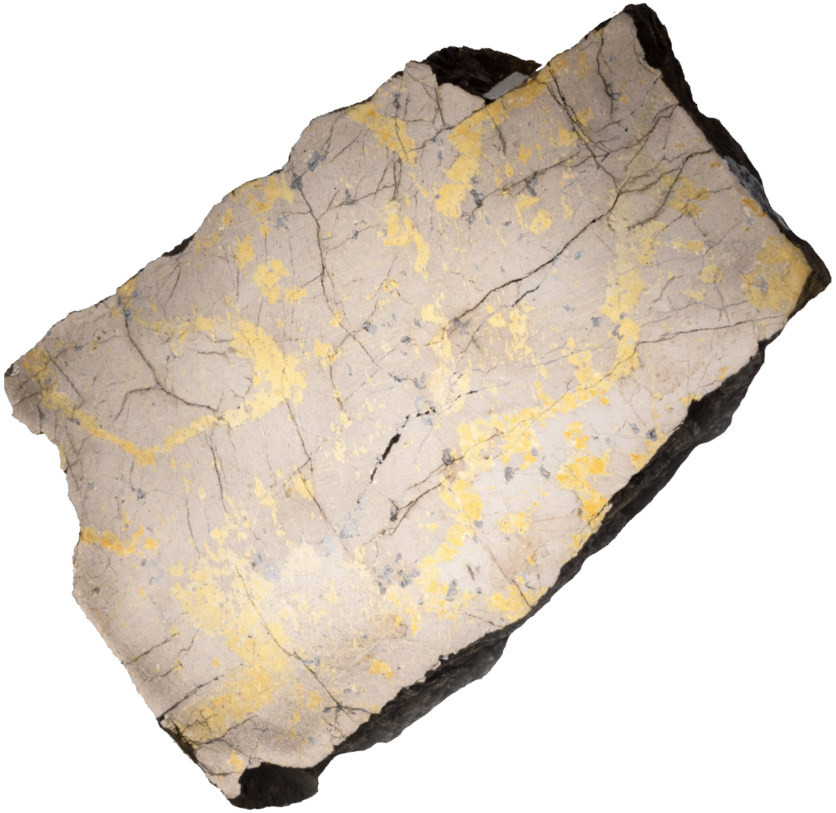
Commemorative medal
"50th Anniversary of the
Ufalei Nickel Combine."
From the collection
of the Mining Museum



Commemorative medal
"50th Anniversary
of the Severonickel Combine."
From the collection
of the Mining Museum

Shalygin L.M., Savva V.P., Shmonin Yu.B., Galushko O.Ya. Waste gas composition and blast assimilation during conversion of copper-nickel matte // Journal of Mining Institute. 1978. Vol. 78. P. 3-6. https://pmi.spmi.ru/pmi/article/view/11093

Abstract. The composition of the exhaust gases from the converter process allows us to judge the degree of absorption of oxygen from the blast, the burnout of metallic iron from the matte and other features of the development of physical and chemical transformations in the converter bath.



Pentlandite-talnakhite ore. Talnakh deposit, Norilsk. From the collection of the Mining Museum

Commemorative medal "Norilsk Mining and Metallurgical Combine" (obverse). From the collection of the Mining Museum





Commemorative medal "Norilsk Mining and Metallurgical Combine" (reverse). From the collection of the Mining Museum

Shalygin L.M., Savva V.P., Galushko O.Ya. Blast flame temperature at conversion of copper-nickel matte // Journal of Mining Institute. 1978. Vol. 78. P. 63-64. https://pmi.spmi.ru/pmi/article/view/11107

Abstract. The concept of blast plume temperature (temperature of the oxidation reaction zone in the converter bath), introduced in the book “Converter processing in non-ferrous metallurgy” was further used in the analysis of various aspects of converter operation.

Rusakov M.R., Vostrikov G.V., Shalygin L.M., Khodzitskaya V.S. Character of slag movement in the depletion unit // Journal of Mining Institute. 1978. Vol. 78. P. 70-73. https://pmi.spmi.ru/pmi/article/view/11109

Abstract. When creating a pyrometallurgical unit must take into account such an important factor as the nature of the movement of slag melt in it, which means both the direction and power of slag flows, and the degree of mixing of the melt in different zones of the unit.

Rusakov M.R., Lebedinskaya N.A., Vostrikov G.V., Shalygin L.M. Investigation of the degree of slag bath mixing by gas // Journal of Mining Institute. 1978. Vol. 78. P. 107-110. https://pmi.spmi.ru/pmi/article/view/11117

Abstract. The correct choice of the optimal design of the depletion unit (geometry of the furnace space, location and depth of tuyere, etc.) is not possible without knowledge of the nature of slag movement, especially the degree of its mixing. In this connection cold modeling of slag bath motion in a continuous process of slag depletion was carried out.

Shalygin L.M. Elder of Russian mining science // Journal of Mining Institute. 1995. Vol. 142. P. 233-243. https://pmi.spmi.ru/pmi/article/view/9876

Abstract. The article is devoted to the issues of formation and development of mining and metallurgical science in Russia. It is shown that the fundamental thoughts about the necessity of higher mining education belong to M.V. Lomonosov and his colleagues at the Academy of Sciences. The outstanding role of M.F. Soimonov as a major scientist, statesman and direct organizer of the first Russian St. Petersburg Mining School, which later became the Mining Institute, is highlighted. The author characterizes the Russian scientific schools in the field of geology, mining and metallurgy, formed at the Mining Institute, and their most prominent representatives.



Model of a blast furnace with cylindrical bellows. Aleksandrovsky Plant, Petrozavodsk. Gift of Empress Catherine II. 1789. From the collection of the Mining Museum



Ceiling panel of the Column Hall of the Mining Museum (fragment): "Catherine II, Foundress of the Mining School, Instills in Her Pupils Submission to the Sovereign, Encourages Them to Labor and to the Acquisition of Knowledge in the Sciences Taught in This Institution" ►

Ceiling panel of the Column Hall of the Mining Museum (fragment): "Alexander I Grants His Favors and Privileges to the Mining Cadet Corps" ►

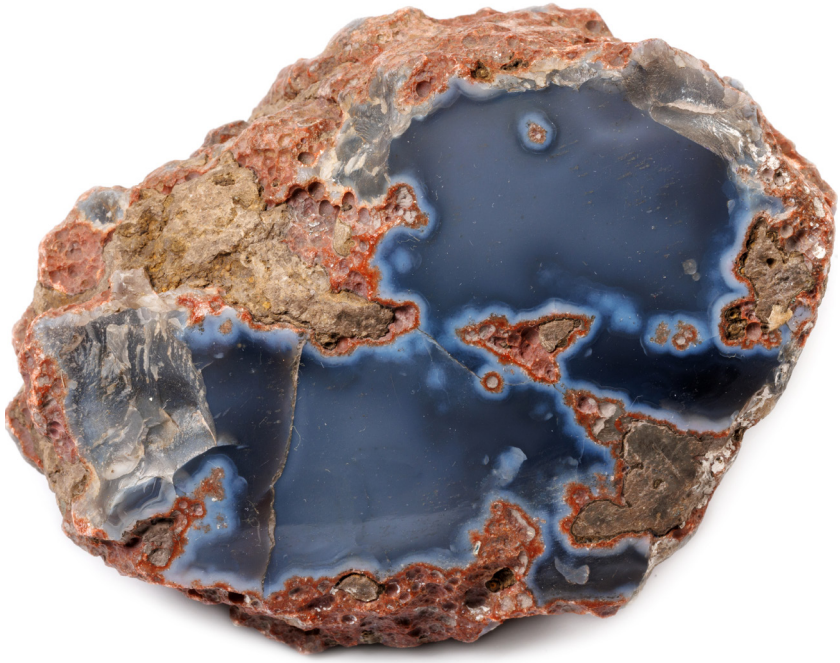
Ceiling panel of the Column Hall of the Mining Museum (fragment): "Peter the Great, Founder of Mining Production, Looking with Satisfaction upon Its Successes and Flourishing State" ◄





Shalygin L.M., Polyarnaya Z.A., Brylevskaya E.A. Prominent characters of Russian history of the late 18th - early 19th centuries in their involvement in the stages of development of the Mining Institute // Journal of Mining Institute. 2005. Vol. 163. P. 105-110. https://pmi.spmi.ru/pmi/article/view/8360

Abstract. This article presents outstanding scientists of Russia's first higher technical school – G.V. Plekhanov Leningrad Mining Institute. The authors' attention is drawn to the activities of M.F. Soimonov, A.A. Musin-Pushkin, N.A. Lvov, V.V. Kapnist, A.N. Olenin, D.I. Khvostov, G.R. Derzhavin, I.I. Chemnitzer and other people who studied or worked at the Mining Institute, patronized the first technical university of Russia or simply knew the graduates of the Mining



Chalcedony. Nerchinsk District.
From the collection of the Mining Museum



Portrait of M.F. Soymonov.
Conference Hall of the Mining University

School. In a lively form, the authors tell about outstanding figures of Russian history of the 18th – early 19th century, associated with the Mining Institute, who took part in the scientific and cultural life of Russia at that time.

Shalygin L.M., Chirkst D.E. St. Petersburg Mining Institute - the cradle of chemical and metallurgical school of Russia // Journal of Mining Institute. 2005. Vol. 165. P. 7-9. https://pmi.spmi.ru/pmi/article/view/8221

Abstract. The development of the chemical and metallurgical school of the St. Petersburg Mining Institute from the establishment of the university to the present time is shown. The main achievements in the field of metallurgy and chemistry, which served as a basis for the development of modern scientific schools of the metallurgical faculty, are presented.



Collection "First Products of Integrated Metallurgical Processing of Ores and Concentrates from the Norilsk Deposits, Obtained by the LGI Nickel Group" (fragment)
From the collection of the Mining Museum



Collection "Cobalt Extraction from Nickel Ores of the Soviet Union."
From the collection of the Mining Museum

Shalygin L.M., Konovalov G.V., Kosovtseva T.R. Conditions of blast feeding into melts and development of means of intensification of blast mode // Journal of Mining Institute. 2006. Vol. 169. P. 231-237. https://pmi.spmi.ru/pmi/article/view/7892

Abstract. In this paper the existing methods of an air-blast supply in a melt are considered. The capa-bility of increase of a specific duty of an autogenous furnace, lowering of metal splashings and heat wastes with the help of a spatially oriented air-blast supply is exhibited, which one attaches a melt regulated rotary movement. The essentially new class radially of axial blowing tuyeres en-suring a spatially oriented air-blast supply is described.

Scientific edition

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