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INHALT

ECOLOGY IN EASTERN EUROPEAN TERMINOLOGY
INTRODUCTORY REMARKS

Tatjana Petzer

The Soviet Union is remembered as a lab for socio-economic changes on larges scales and environmental catastrophes: the Chernobyl disaster, the Aral Sea tragedy, and ecocide[1]. However, little is known about the groundbreaking concepts and theories of Russian and early Soviet science which laid the foundation for systemic ecological thinking, environmental consciousness for nature conservation, and corresponding initiatives of the revolutionary years after 1917. The isolation of Eastern Europe that came as a result of Stalinism and the Cold War led to Soviet science developing its own scientific approaches and terminology during the 20th century. This does not only include ideological constructions and practices such as the pseudo-scientific Lysenkoism[2] which outlawed genetics and led to disastrous effects on agriculture, the people, and the scientific community. Soviet science has also managed to continue and unfold the new concepts and interdisciplinary dynamics of the ecological turn on the threshold of the 20th century, a development which, at that time, was only sporadically noted in the West. In the context of its thematic focus on Eastern European ecological terminology, this issue discusses a selection of these concepts.

Russian and Soviet scientists were always aware of and reflected upon their own contributions and the different potentials of environmental and ecological sciences. Their milestones include:

- the foundation of early soil science by pioneering Russian professor of mineralogy and geology at the St. Petersburg University, Vasilii Dokuchaev (1846–1903), who developed a combinatoric approach to environmental factors such as geology, topography, climate, and organisms, and, in accordance with their interaction, formulated the first soil classification system distinguishing ›natural-historical zones‹ (*estestvennoistoricheskie zony*)[3] such as the taiga, tundra, steppe, and others;

- the foundation of scientific forestry by Georgii Morozov (1867–1920), who was appointed professor for this field at St. Petersburg University. Here, he systematically developed the fundamentals of community ecology, also referred to – with recourse on the notion of *Biozönose* (biocoenosis) as coined by the German zoologist Karl Möbius which describes interacting organisms within a habitat – as biocoenology or synecology. Morozov was a vehement advocate for the foundation of nature sanctuaries (*zapovedniki*) in which any human activity other than scientific research was prohibited by law,[4] a necessity he postulated in 1910 at the Congress of Russian Naturalists;

- Aleksei Pavlov's (1854–1929) recognition of humanity as the main force of the Earth's evident change and its impact on a geological scale. In 1922, the professor and founder of the Moscow

1 See Murray Feshbach, Alfred Friendly (eds.): *Ecocide in the USSR: Health and Nature under Siege*, New York: Basic Books 1992.

2 A neo-Lamarckian doctrine developed and practiced by the agronomist Trofim Lysenko (1898–1976) and his supporters who claimed that crop plants could be ›educated‹ to free themselves from dependencies on soil and climatic conditions—to be transformed by being conditioned to new environments.

3 Borrowing from German terminology, the geographer Lev Berg (1876–1950) replaced Dokuchaev's ›natural zone‹ with ›geographical landscape‹ (*geograficheskii landshaft*).

4 Under Lenin, the resolution »On the Protection of Nature, Gardens, and Parks« was approved by the Soviet government in 1921. See Douglas R. Weiner: »Community Ecology in Stalin's Russia: ›Socialist‹ and ›Bourgeois‹ Science«, in: *Isis* 75 (1984), no. 4, pp. 684–696.

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school of geology introduced the alternate geochronological notion of the ›anthropogene period‹ (*antropogennii period*) or ›anthropogene‹ (*antropogen*)[5] as a substitute for the entire quaternary, a notion which was broadly used in the Soviet Union and Eastern Europe since it was officially accepted in 1963;[6]

- the rise of global ecology, or, in the words of Vladimir Vernadsky[7] (1863–1945), a student of Dokuchaev and professor of crystallography and mineralogy at Moscow University: the ›planetarian role‹ of the ›living matter‹ in the ›biosphere‹, a notion adapted from Austrian geologist Edward Suess who coined it in 1875 to distinguish the life-saturated envelope of the Earth's crust. However, Vernadsky used it to emphasize the anthropogenic transformations of biogeochemical cycles of the biosphere which, in turn, alterates itself towards a ›noosphere‹.

At this point, the aforementioned concept transfer allows for a recourse towards the polymath of the Russian Enlightenment, Mikhail Lomonosov, who, after being educated in humanities, natural sciences, and engineering in St. Petersburg, Moscow, Kyiv, Marburg, and Freiburg, introduced the linguistic basis for higher education into the Russian language and Russian terminology for his wide-ranging, multidisciplinary research from Earth studies to astronomy. His goal was to understand that the migration and translation of concepts is more than the appropriation of Western science and thought upon domestic learning. The Russian Academy of Science was recognized in the scholarly world and has maintained international cooperation. Nevertheless, conceptual migration processes in the opposite direction were non-existent or marginalized. Even though prerevolutionary and early postrevolutionary science was multilingual and present in international academic journals, concepts and theories from Russian and early Soviet geosciences were barely noted, let alone Russian-language publications, for instance on the establishment of interdisciplinary research fields such as permafrost science or permafrostology (*mrzlotovedenie*), which was later renamed to ›geocryology‹.[8] Here, a prominent example is Vernadsky's work on the biosphere: he taught at the Sorbonne in Paris between 1922 and 1926, where he published *La géochimie* (1922) and developed his concept of the biosphere, which was published in 1926 in Russian (*Biosfera*) and translated into French in 1929 (*La Biosphère*). However, this work remained unrecognized for decades, due to the terminological confusion, the misleading notion of the biosphere in general, and Vernadsky's holistic sphereological approach to the biogeochemistry of life and ecological co-evolution.[9] Moreover, the retrospective misreading of Vernadsky to fit the Soviet ideology of a collective communist human world transformative agency[10] neglects the scientists' resistance to the political bias as well as their independent and global ecological thought.

In addition to Paris, Berlin and London must be mentioned as places for the transfer of ideas of Soviet provenance: in 1927, the Russian Naturalist Week[11] was initiated in the context of the Soviet government's exchange agreement with Germany, followed by the Second International Conference on the History of Science and Technology in 1931, where scientists from the Soviet Union affected socialist thinkers and the British tradition of »red science«.[12] A few years later, the relationship between the East and the West changed, and all of the 1931 participants, together with further ecological scientists and thinkers as well as opponents of Lysenko fell victim to the Stalinist purges.[13] Nevertheless, the interest in Soviet science

5 The Russian ›-gen‹ suffix usually signifies a geological period.

6 A Commission for Quaternary Research was established in 1927 and chaired by Pavlov in the first couple of years. The commission's second session on stratigraphy accepted both ›quarternary‹ (*chetvertichnyi*) and ›anthropogene‹ (*antropogenovyi*) as equivalent terms.

7 Cyrillic letters are transliterated according to the Library of Congress romanization system, however, in the body of the text, familiar spellings of names are used in some cases (e.g. Vernadsky instead of Vernadskii).

8 See Mikhail I. Sumgin: *Vechnaia merzlota, pochvy v predelach SSSR* [Permafrost Soils in the USSR], Moscow: Akad. Nauk SSSR 1926. Id.: *Obshchee merzlotovedenie* [General Permafrostology], Moscow: Akad. Nauk SSSR 1940. Petr F. Shvetsov: *Vvodnye glavy k osnovam geokriologii* [Introductory Chapters on the Principles of Geocryology], Moscow: Akad. Nauk SSSR 1955, pp. 23–24.

9 Nicholas Polunin, Jacques Grinevald: »Vernadsky and Biospheral Ecology«, in: *Environmental Conservation* 15 (1988), no. 2, pp. 117–122, here p. 118.

10 Simon L. Lewis, Mark A. Maslin: »Defining the Anthropocene«, in: *Nature* 519 (2015), no. 7542, pp. 171–180, here p. 173.

11 Oskar Vogt, A[leksandr] E. Fersman: »Die Russische Forscherwoche in Berlin«, in: *Osteuropa* 2 (1927), no. 8–9, pp. 459–465.

12 John Bellamy Foster: *The Return of Nature: Socialism and Ecology*, New York, NY: Monthly Review Press 2020, p. 334.

13 See John Bellamy Foster: *Capitalism in the Anthropocene: Ecological Ruin or Ecological Revolution*, New York: Month-

persisted. In 1939, British ecologist Richard Carpenter reviewed the latest achievements of the synecological research conducted in the Soviet Union, including an 18-page-long list of his East European colleagues' publications.[14]

The Purges, the Second World War and the Cold War, Stalin's 1948 Plan for the Great Transformation of Nature, geoengineering, and Lysenko's attempt to intervene into forest management as well as the environmental degradation in the decade following Stalin's death in 1953 (Lysenkoism was not condemned and abandoned until 1965)[15] finally led to a caesura in ecologic science and environmental consciousness. First and foremost, there was the influential concept of biogeocoenology which was derived from forestry. Established by the geobotanist Vladimir Sukachev (1880–1967) in the 1940s as a further developmed form of biocoenology and as a ›biospheric‹ science in Vernadsky's sense, it provided the backbone to oppose and ultimately defeat Lysenko in the early 1960s.[16] Sukachev was aware of the closeness of his concept of biogeocoenosis to the Western »rather vague and not entirely unambiguous« notion of the ecosystem,[17] which, after being introduced by Arthur Tansley (1935), was hardly used until the Odum brothers' systematic take on an ecosystem ecology after the Second World War.[18] Secondly, on this fertile scientific ground of biogeocoenosis and its mathematical modelling of the 1950s and 1960s, Soviet climatology surrounding Mikhail Budyko (1920–2001) provided first calculations on the alarming interactions between the cryosphere, the Arctic greenhouse effect, and global climate change.

Following the early mystification of Vernadsky as philosopher of ›Russian Cosmism‹,[19] Sukachev was consequently attributed to this line of thought.[20] Citing Soviet scientists and their concepts as an exotic side stage of the history of global ecology, ecocriticism, and the Anthropocene debates, recent studies provide profound insight into the interaction between Soviet and Western scientists and its impact on contemporary ecological discourse.[21] There is also a domestic post-Soviet (post-colonial) re-thinking of Russian ecological and revival of holistic biospheric thought.[22] Recognizing the quick adaptation of Western popular concepts re-connect with the Western scientific discourse, the revision also includes the re-evaluation of terminology.[23] As a starting point, these post-Soviet developments chose the postulate of a Russian paradigm of non-Western (non-Darwinian) ecological and evolutionary thought which is not only different, but more prolific than the Western one.[24] This paradigm includes parameters such as the

ly Review Press 2022, pp. 274, 335.

14 J. Richard Carpenter: »Recent Russian Work on Community Ecology«, in: *Journal of Animal Ecology* 8 (1939), no. 2, pp. 354–386. See also id.: »Review: A New Russian Textbook in Ecology«, in: *Ecology* 20 (1939), no. 2, pp. 310–312.

15 See Zhores A. Medvedev: *The Rise and Fall of T. D. Lysenko*, New York, NY: Columbia Univ. Press 1969.

16 In a booklet, Sukachov only praised Stalin's transformation project to draw attention to the importance of forest protection, also describing (but not commenting on) Lysenko's plan to plant trees as a shelterbelt network – a plan which was deemed to fail from the very beginning. See Akademik V[ladimir] N. Sukachev: *Stalinskii plan preobrazovaniia prirody* [Stalin's Plan of Transformation of Nature], Moscow: Akad. Nauk SSSR 1950, pp. 15–19.

17 V[ladimir] N. Sukachev, N[ikolai] V. Dylis: *Osnovy lesnoi biogeotsenologii*, Moscow: Nauka 1964. Engl.: *Fundamentals of Forest Biogeocoenology*, Edinburgh: Oliver & Boyd 1968, p. 13: »poniatie ėkosistema dovol'no neopredelenno i ne vpolne odnoznachno«.

18 See Eugene P. Odum: *Ecology*, New York: Holt 1963. Howard T. Odum: »Ecological Tools and Their Use: Man and the Ecosystem«, in: *The Connecticut Agricultural Experiment Station, Bulletin* (1962), no. 652, pp. 57–75.

19 Russian cosmism is an umbrella term coined by adherents of the eccentric self-thought philosopher and religious thinker Nikolai Fedorov. The term aimed to unify a broad spectrum of scholars and biopolitical utopianists which were included in the eponymous anthology. See S[vetlana] G. Semenova, A[nastasiia] G. Gacheva (eds.): *Russkii kosmizm: Antologiia filosofskoi mysli* [Russian cosmism: anthology of philosophical thought], Moscow: Pedagogika 1993.

20 Petr Karako, professor of philosophy at Belorusian State University, claimed that Sukachev succeeded Vernadsky's cosmism. See P[etr] S. Karako: »V.N. Sukachev i russkii kosmizm« [Sukachev and Russian Cosmism], in: *Vestnik VGU. Seriia Filosofiia* 2020, no. 1, pp. 15–28.

21 See Jonathan D. Oldfield: *The Soviet Union and Global Environmental Change: Modifying the Biosphere and Conceptualizing Society-Nature Interaction*, London: Routledge 2021. Marco P. Vianna Franco, Antoine Missemer: *Early Soviet Ecology. A History of Ecological Economic Thought*, London: Routledge 2022.

22 In his last years, the historian of natural sciences Ėduard N. Mirzoian (1931–2014) started documenting Soviet biosphereological approaches and ecological theories in the series *Stanovlenie ėkologicheskikh kontseptsii v SSSR* (The Formation of Ecological Concepts in the USSR), published since 2013. Their publication continued after his death under the redaction of his pupil.

23 See E[katerina] A. Grigor'eva, A[rkardii] I. Grigor'ev: »Istoriia formirovaniia sistemnykh poniatii i terminov v ėkologii« [History of the formation of systemic concepts and terms in ecology], in: *Omskii nauchnyi vestnik* 106 (2012), no. 2, pp. 156–159.

24 See G[eorgii] A Zavarzin: »Smena paradigm v biologii« [Paradigm change in biology], in: *Vestnik RAN* 65 (1995), no. 1, pp. 8–23. A[leksei] M. Giliarov: »Stanovlenie ėvoliucionnoga podchoda kak ob'iasnitel'nogo nachala v ėkologii« [The formation of the evolutionary approach as an explanatory

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nutrient cycle, decomposition by microorganisms,[25] synthesis, and biogeocoenotic evolution.

Against this background, the international network »Russian Ecospheres. Forms of Ecological Knowledge in Russian Literature, Culture and History«[26] was established last year. It is funded by the German Research Foundation (DFG) and collaborates in the interdisciplinary investigation of the Russian[27] paradigm of ecological thought. All contributors to this issue are members of this research project, with the exception of an extern expert from Kyiv, Alexander Protasov, Professor at the National Academy of Sciences of Ukraine's Institute of Hydrobiology. In co-authorship with Georgy Levit, a private lecturer in biology at the University of Jena,[28] the two experts on Vernadsky dedicated their paper to the Ukraine period of Vernadsky's work and his concept of living matter (*zhivoe veshchestvo*). Tatjana Petzer, professor of Slavic literary and cultural studies at the Karl Franzens University of Graz, provides an introduction on Sukachev's notion of biogeocoenosis (*biogeotsenoz*). Both concepts are closely linked to the establishment of integrative disciplines in the Soviet Union, biogeochemistry, and biogeocoenology. A third cross-disciplinary area of study is introduced with the review on a survey book on *Geocryology* by Andy Bruno, associate professor of history and environmental studies at Northern Illinois University and an expert on the Russian Arctic.[29] Mieka Erley, associate professor of Russian and Eurasian studies at Colgate University and author of a book on Russian soil, discusses the Russian notion of metabolism (*obmen veshchestv*) which refers to both circulatory systems for constituting ecological as well as social equilibrium.[30] Clemens Günther, research associate for Slavic literature at Freie University of Berlin, and Philip Kohl, research associate for Slavic literature at Ludwig Maximilian University of Munich who currently holds the Feodor Lynen Research Fellow position at the University of Zurich, both initiators and coordinators of the Russian Ecospheres network, provide a system-theoretic perspective. Departing from conceptual history, their contributions on the notions of regulation and irreversibility respectively analyze the interdepending conceptualization of nature and culture within the realms of the emerging computation, cybernetics, and semiotics of culture. Thus, they demonstrate one of the network's basic concerns: the interdisciplinary approach to a genuinely multidisciplinary science (or, rather, a bundle of ecological and environmental sciences), its cross-cultural framework of terminology, and its undisciplined thought in the Russian longue durée.

principle for ecology], in: *Zhurnal Obshchei Biologii* 64 (2003), no. 1, pp. 3–22. Edmundas Lekevičius: »The Russian Paradigm in Ecology and Evolutionary Biology: *Pro et Contra*«, in: *Acta Zoologica Lituanica* 16 (2006), no. 1, pp. 3–19.

25 S[ergei] N. Vinogradskii: »O roli mikrobov v obshchem krugovorote zhizni« [The role of microbes in the general cycle of life (speech of 1896)], in: *Vestnik RAN* 66 (1996), no. 12, pp. 1116–1120.

26 For more information see https://russianecospheres.org/.

27 Here, ›Russian‹ refers to the historically grown epistemic framework for approaching the entangled Northern Eurasian space.

28 George S. Levit: *Biochemistry – Biosphere – Noosphere. The Growth of the Theoretical System of Vladimir Ivanovich Vernadsky*, Berlin: Verl. für Wiss. und Bildung 2001. A[lexander] A. Protasov: Kontseptsii biosferi i zhivogo veshchestvo v prilozhenii k issledovaniiam zhizni v gidrosfere [The concepts of biosphere and living matter applied to the study of life in the hydrosphere], in: V[olodimir] I. Vernads'kii: *Geokhimiia zhivoi rechovini* [The Geochemistry of Living Matter], part II, Kyiv: Veles 2012, pp. 551–571.

29 Andy Bruno: *The Nature of Soviet Power: An Arctic Environmental History*, New York, NY: Cambridge University Press 2016.

30 Mieka Erley: *On Russian Soil: Myth and Materiality*, DeKalb: Northern Illinois Univ. Press 2021.