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SCIENTIFIC WORK OF THE DEPARTMENT OF PHYSICAL GEOGRAPHY
LENINGRAD UNIVERSITY USSR

[Translation]

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LENINGRAD UNIVERSITY USSR

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N. S. Chochia

The basic tendency of the scientific work of the Department of Physical Geography consists in the development of landscape studies-- which is one of the most promising and important branches of physical geography, both in theoretical and in practical terms.

Academician L. S. Berg, founder of landscape studies, headed the Department of Physical Geography from 1917 to 1950. As a scholar of unusually broad erudition, almost encyclopedically learned, who by his works in various fields of geography made a most valuable contribution to the development of the natural sciences, Academician L. S. Berg first expressed the idea that landscape study is the chief subject of geographical science. (In view of the short length of the article there is no possibility of going into detail about the activity of L. S. Berg and other coworkers who took part in setting up the Department of Physical Geography and in developing its scientific specialization.)

At the present time the Department is continuing to develop this tendency (especially in the works of A. G. Isachenko, S. V. Kalesnik, V. B. Sochava) and it is the leader of the Soviet school of landscape studies.

The Department has published a number of monographs which serve as handbooks and texts for all geographic faculties of the country. Among such works are, for example, the books of L. S. Berg Priroda SSSR [Nature of the USSR] and Landshaftno-geoficheskie Zony SSSR [Landscape and Geographic Zones of the USSR], which have gone through several editions, and Fizicheskaya Geografiya SSSR [The Physical Geography of the USSR] of S. P. Suslov, Osnovnyye Voprosy Fizicheskoy Geografii [Basic Problems of Physical Geography] of A. G. Isachenko, Ocherki po Fizicheskoi Geografii Evropy, Avstralii, Severnoi i Yuzhnoi Ameriki [Outlines of the Physical Geography of Europe, Australia, North and South America] of A. I. Iauputnin, and others.

In addition, the scientific workers of the Department have written a number of articles in which, together with the theoretical problems of the study of landscapes, there have been discussed questions of the methodology of complex field study of landscapes.

The independent nature of field study of landscapes was first shown by S. V. Kalesnik, who in 1940 raised the question of the necessity and possibility of landscape mapping and worked out the principal criteria for field study of landscapes. This tendency took shape in the field trips of the Department and in the training of graduate students. There were also worked out problems of landscape typology, intra-landscape regionalization, and of regionalization on various scales.

In recent years the members and graduate students of the Department have been occupied in the study of landscapes of various regions of our country: Northern area of Lake Ladoga (O. N. Kazakova); Karelian Isthmus (G. V. Gorbatskiy, V. S. Zhekulin, A. G. Isachenko, O. N. Kazakova, S. M. Lukoiyanov, N. S. Chochia); Leningrad oblast (Z. V. Borisova, V. S. Zhekulin, A. G. Isachenko, S. M. Lukoyanov); Vologda oblast (Z. V. Borisova, O. N. Kazakova, S. M. Lukoyanov, N. N. Pavlova); regions of the Arctic (Zh. M. Belorusova, O. N. Kazakova, M. M. Yermolayev, V. B. Ivanov); Moldavia (V. B. Sochava); Northern Ural (N. S. Chochia); Crimea (Krym) (G. V. Gorbatskiy, Z. F. Kryukova, N. N. Pavlova), Far Eastern regions of RSFSR (A. F. Pryalukhina, V. B. Sochava). Particular attention was paid in these research projects to landscape mapping. Of particular scientific and methodological interest in this area were the landscape maps of the Karelian Isthmus, the Northern Lake Ladoga area, and of the Northwestern areas of the RSFSR, compiled by A. G. Isachenko and O. N. Kazakova. A. G. Isachenko also drew up a course Physical-Geographic Mapping. The first part of this course has been published as a textbook for faculties of geography, and the second and third parts have been made ready for the press.

The development of new, more effective and exact methods of research should aid in attaining success in deeper investigations of landscape problems at the present time. Therefore the department has included in its plan the problem of geochemical methods of study of landscapes. M. M. Yermolayev is working on this. Preliminary results have shown the practical importance and the promise of such a method of investigation. Objective geochemical indices have been discovered which can be used successfully in prospecting for deposits of rare elements found in differing landscape surroundings. In addition use has been made of the method of paleogeography, in particular in reconstructing the landscapes of ancient surfaces formed in subaerial conditions.

Much of the attention of the Department has been given to the elaboration of methods for complex investigations carried on from a fixed station. In these investigations studies are made of processes requiring lengthy systematic observations, such as heat and moisture cycles, erosional processes, phenological processes and the like. All this is necessary for the study of the seasonal rhythms and dynamics of a landscape. Particular attention is paid in these observations not only to qualitative, but also to quantitative characteristics which make it possible to prove more conclusively the intra-landscape subdivisions of a territory. With this aim workers of the Department (G. V. Gorbatskiy, V. B. Ivanov, D. F. Tumanova, N. S. Chochia) have since 1954 been carrying on observations and preparing methods for such investigations at a specially organized physical-geographic station in the northern part of the Karelian isthmus.

Physical-geographic (landscape) regionalization provides a natural-scientific basis for carrying out various economic undertakings which demand a multi-faceted analysis of natural conditions. Determination of the principles and methods of physical-geographic regionalization on the basis of scientific doctrines of landscapes has been undertaken by V. B. Sochava. N. N. Ivanov in his works has undertaken the landscape and climatic regionalization of the world.

An important role in the development of the scientific study of landscapes has been played by the works of L. S. Berg on the history of Russian geographical science. Among the works published in recent years on the history of geographic knowledge, one must cite the books of R. L. Zolotnitskaya about N. A. Severtsov, of A. G. Isachenko about G. N. Vysotskiy, of V. V. Nevskiy about L. F. Kruzenshtern and Yu. F. Lisianskiy, as well as the learned work of V. V. Nevskiy Russkiye Puteshestvenniki-Issledovateli [Russian Travellers and Researchers]

The Department was the organizer of the convocation of the All-Union Landscape Conferences which took place in Leningrad in 1955, in 1956 in Lvov, and in 1958 in Tbilisi. A. G. Isachenko, O. N. Kazakova, S. V. Kalesnik, V. B. Sochava, D. F. Tumanova and N. S. Chochia took part in them. Doubtless such conferences will do much to further the development of the scientific study of landscapes, as well as aid in the increase and coordination of landscape field studies carried on by various geographical institutions.

Of great significance for the development of landscape theory was the work of S. V. Kalesnik Osnovy Obshchego Zemlevedeniya [Basic Elements of General Geography], which has gone through three editions.

Expanding the concept of the geographic (landscape) cover [geosphere] S. V. Kalesnik views landscapes as being its separate parts, having their own individual characteristics, but inseparably connected with the geographic cover [geosphere]. In S. V. Kalesnik's Obshchee Zemlevedeniye [General Geography] the idea of the inter-relationship of the general and of the specific is emphasized, which is of great significance for the development of many general problems of physical geography.

Almost from the first years of the Department's existence many of its members have devoted their investigations to the problems of the physical geography of the Far North. G. V. Gorbatskii, V. B. Ivanov, and S. V. Kalesnik have prepared and given a course in the department on the subject of Permafrost and Glaciology. In the monographs Obshchaia Glatsiologiya [General Glaciology] and Gorno-Lednikovyye Rayony SSSR [Alpine Glacier Regions of the USSR], S. V. Kalesnik for the first time in Russian literature in the field has systematically set forth the principles of the study of glaciers, advancing new ideas which were further successfully developed by P. A. Shumskiy, a student of the Department, and by other glaciologists of the USSR. Works of G. V. Gorbatskiy, M. M. Yermolayev, and V. B. Sochava have been devoted to study of the North. Among these works those of significant interest were such as Sovetskaya Arktika [The Soviet Arctic] of G. V. Gorbatskii with the assistance of other scholars, Priroda Zarubezhnoi Arktiki [Nature of the Foreign Arctic] of G. V. Gorbatskiy, as well as the monograph of M. M. Yermolayev on the Lyakhov and De Long Islands.

Members of the Department are working on the preparation of important monographs and periodical publications. A. G. Isachenko has prepared for publication the second edition of L. S. Berg's monograph Priroda SSSR. S. V. Kalesnikov has carried out the basic scientific editing, and is one of the authors, of the symposium Voprosy Geografii [Problems of Geography] devoted to the XVIII International Geographic Congress in Rio de Janeiro. He also edited the historical geographic atlas Petersburg--Leningrad, published by the University for the 250th anniversary of Leningrad and the 40th anniversary of the October Revolution. V. B. Sochava is continuing to edit the Geobotanical Map of the USSR on a scale of 1:4,000,000, which was shown at the XVIII International Geographical Congress. G. V. Gorbatskiy is the editor and author of several chapters prepared for publication in the book Novaya Zemlia. M. M. Yermolayev has edited a number of monographs devoted to Franz Joseph Land, as well as being one of the authors and editors of the monograph Boksity Sovetskogo Soyuza [Bauxites of the Soviet Union]. Izvestiya Geograficheskogo Obshchestva [News of the Geographic Society] and Trudy Laboratorii ozerovedeniya AN SSSR [Works of the Limnological Laboratory of the Academy of Sciences of the USSR] continue to appear under the editorship of S. V. Kalesnik.

With each succeeding year the scientific relationships of the Department with the geographical institutions of our country and of foreign countries as well are becoming firmer. Field trips, lending supervision or aid in special problems, lectures and consultations -- all this is by no means a full list of the work which binds the Department with the Botanical Institute, the Limnological Laboratory, the Arctic Institute, the Laboratory of Aeromethods, the All-Union Institute of Technological Prospecting, the editors of the Maritime Atlas, the Institute of Arctic Geology, and many other scientific institutions. The Department has given help through methodological guidance, lectures and consultations to a whole series of higher educational institutions of the country. In particular, during the past two years workers of the Department have been sent to the Vologda Pedagogical Institute (N. N. Pavlova) and to the Yakut State University (G. V. Gorbatskiy).

Workers in the Department are carrying out field trips outside our country. V. B. Sochava has made a number of useful trips through Czechoslovakia and Rumania with the aim of studying the plant life of those countries. V. B. Sochava and M. P. Petrov will take part in trips to the Chinese People's Republic [CPR], working for two years as part of the Soviet-Chinese field study expedition and of the Tsinkhai-Gan'suy expedition of the Academy of Sciences of the CPR. A. G. Isachenko will take part in the important work of determining the regionalization of the CPR.

S. V. Kalesnik, as a member of the Soviet delegation, read a report at the International Geographic Congress in Brazil. The thesis of the reports of N. N. Ivanov and V. B. Sochava were printed in Voprosy Geografii, published for the Congress in Russian and French. S. V. Kalesnik has taken an active part in the work of the Hungarian Geographic Conference (Budapest, 1955) and of the Conference of the Polish Geographic Society (Krakow, 1958).

During trips abroad the workers of the Department presented lectures and reports and held consultations with their foreign colleagues on basic theoretical problems of physical geography and the methodology of field study of landscapes. S. V. Kalesnik presented more than ten reports and communications during his trip to Poland in June 1954. In Czechoslovakia (1954) V. B. Sochava read reports in the departments of physical geography of Bratislava, Prague, and Brno Universities. S. V. Kalesnik held consultations with foreign institutions in Hungary (1955) and Yugoslavia (1957), as did V. B. Sochava in Rumania (1957) and China (1957-1958), M. P. Petrov in China (1957-1958), A. G. Isachenko in China (1957-1959). S. V. Kalesnik presented 14 reports to various geographic societies of Yugoslavia and to the Serbian Academy of Sciences, as well as a course of lectures to the students of the Geographical Institute of

the Sorbonne (the University of Paris) and reports to professors of that institute (1957). N. S. Chochia presented reports in the Warsaw and Torun universities (1958). During a two year assignment to the CPR, A. G. Isachenko will read lectures on physical-geographic mapping, methods of field study of landscapes, basic problems of the scientific study of landscapes, and of regionalization for professors, teaching staff and graduate students.

The Department has received the Polish geographers, Doctor L. Roszko, Professor S. Petkiewicz, and Professor Yu. Konratsky, with whom field trips have been made through Leningrad oblast, Karelia and the Kola Peninsula. Other foreign scholars visited the Department.

The more important monographs and texts prepared by members of the Department have been translated into foreign languages. Priroda SSSR of L. S. Berg has been translated into English, French, and Polish. L. S. Berg's Landshaftno-geograficheskie zony SSSR has been published in India and East Germany. The book Klimat i Zhizn' [Climate and Life] has been translated into Hungarian, and Istoriia Geograficheskikh Otkritii [History of Geographical Discoveries] into German. S. V. Kalesnikov's Osnovy Obshchego Zemlevedeniya [Basic Elements of General Geography] has been published in China, Korea and Poland.

The monographs Fiziko-geograficheskoe Kartirovaniie [Physical-Geographic Mapping] and Osnovnyie Voprosy Fizicheskoi Geografii by A. G. Isachenko have been translated into Chinese and Polish.

In the outlook for scientific research work of the Department the principal problem in the near future will be the systematization of landscapes and of methods of research into them.

The Department proposes carrying out work in this area along the following lines: 1) the improvement of the principles and methods of physical-geographical regionalization; 2) adoption of a methodology for carrying on field investigations of landscapes from a research station; 3) working out of methods for physical-geographic study of separate regions of the USSR and of foreign countries; 4) study of the geochemistry of the landscape cover of the earth.

Of course, these theoretical problems will be studied in connection with the investigation of specific territories of the USSR: the North and Northwestern regions of the RSFSR, the Komi ASSR, Yakutia, separate regions of the Arctic, the Ural, Central Asia, etc, where together with problems of the theory of geography, the problems of their practical application will be studied, chiefly in connection with a rational utilization of separate regions of the country. These goals, worked out by the whole Department, are intended to further and deepen the development of the theory and practice of the scientific study of landscapes.