A New Science City in Siberia

Hilary Koprowski, Jacob A. Brody, William J. Hadlow,
John F. Hotchin, Richard T. Johnson, Leonard T. Kurland

Akademgorodok, an interesting new city devoted entirely to science, has been constructed 3000 kilometers east of Moscow as the focal point for the recently organized Siberian Department of the Academy of Sciences of U.S.S.R. The city, envisioned as the scientific center for Siberian development, was begun in 1959 and is already nearing completion. It has brought to western Siberia a staff of eminent scientists from all parts of the Soviet Union to direct and encourage Siberian scientific efforts.

The Siberian Department was established as part of an overall plan to make better use of the vast natural resources of this section of the Soviet Union. Territorially, Siberia constitutes more than half of the U.S.S.R. Within its geographic boundaries lie 70 percent of the forests of the Soviet Union and a large area of virgin soil and of mineral resources, including coal, oil, and natural gas. Siberia is traversed by several large rivers, including the Irtysh, Yenisey, Lena, and Ob, on which power stations have been built to provide light and heat for its inhabitants.

Akademgorodok (*1*), freely translated by us as Science City, is situated only 19 kilometers from Novosibirsk, the capital of Siberia (Fig. 1), which itself has grown from a workmen's camp on the Trans-Siberian Railway in the second half of the 19th century to a city of more than 1.3 million people. Built along the banks of the Ob River, Novosibirsk was partly settled by Russian farmers who migrated from more crowded areas in search of fertile land. The population of the city grew during the two world wars as workers came to the industries that were springing up in this region. Today, Novosibirsk is an industrial center offering its inhabitants many urban advantages, educational facilities, and cultural opportunities, including theatrical performances, operas, and concerts (Fig. 2). The Siberian capital is linked to Akademgorodok by highways and an electric railway system.

The facilities of the Science City are under the direction of the Chief of the Siberian Department of the Academy of Sciences, M. A. Lavrentyev, who serves as the administrative and scientific head of the city and who is also Vice-President of the Academy of Sciences in Moscow. Academician Lavrentyev and his colleagues have supervised the construction of the city since its inception. According to their general plan, the city is divided into three major units: (i) the university and institutes, (ii) apartment houses and single-family houses for the senior scientific staff, and (iii) smaller dwellings used at present for the construction workers.

University and Institutes

The university of Science City, called the University of Novosibirsk, is still in the process of construction; however, many of the university and institute instructors received part of their education there. The 15 institutes in Akademgorodok are nearly completed (Fig. 3). These, together with five institutes in nearby Novosibirsk, offer a diversified program for scientific training. Ten of the 20 institutes are devoted to physics, mathematics, and technology, five to chemistry, three to biology, and one each to geology and economics. Plans are currently under way for a new Institute of Theoretical Medicine. The three institutes of biology are the Biological Institute, for study of Siberian fauna; the Botanical Garden, for study of Siberian forests; and the Institute of Genetics and Cytology.

Other Siberian centers responsible to the Siberian Department of the Academy of Sciences are the Forestry Institute in Krasnoyarsk, the Biological Institute of Yakutsk, and the Biological Institute in Vladivostok.

Advanced High School and Future Career

Akademgorodok has a special high school of mathematics, physics, and chemistry for advanced students. Young people from schools throughout Siberia are accepted into this school on the basis of competitive examinations. More than 40,000 children, between the ages of 11 and 14 years, are invited to participate in tests which are sent to schools in even the most remote villages. The students who show the greatest ability are brought to larger centers and are given more difficult examinations. Seven hundred children from this group are invited to spend a summer in Akademgorodok, where they are given additional tests and are interviewed by teachers from the advanced high school. During this summer session the children are further evaluated by individual members of the faculty, and 300 students are eventually selected to enter the high school.

Following their graduation from the advanced high school, these students are sought by many universities in the Soviet Union, but most remain in the Science City's graduate training program. Besides having a highly qualified teaching staff, the University of Novosibirsk has a close relationship with the institutes. At Akademgorodok, the academic staffs of the institutes and of the university work together; thus, lectures are given at the university by institute members, and third- and fourth-year university students spend as many as 3 to 6 days a week in one of the institutes, gaining practical experience during college years. No comparable opportunity is available to students in other Soviet centers of scientific education.

The academic and professional titles are separate, as in American universities. The academic ranks are Profes-

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sor, Dozent, and Assistant, which correspond to our Professor, Associate Professor, and Assistant. The scientific ranks, which are not necessarily related to the academic ranks, are Academician, Doctor, and then Candidate. A student attending the university earns a diploma after 5 years of graduate work. To gain the next degree, that of Candidate, he must devote three additional years to study and must defend a thesis. The title of Candidate approximates our Ph.D. degree. To obtain a doctorate, a Candidate must pursue a course requiring from 3 to 20 years of research and study and must defend a second thesis on a more abstruse subject. The various departments elect their own department heads from among the faculty members, generally from among those holding doctorates; the period of tenure is 4 years. The junior posts are filled by Assistants who have received their diplomas after graduate work or have completed the course for Candidate. At present there are 620 Candidates working at the university or at the institutes, and about half of them received at least part of their training at the University of Novosibirsk.

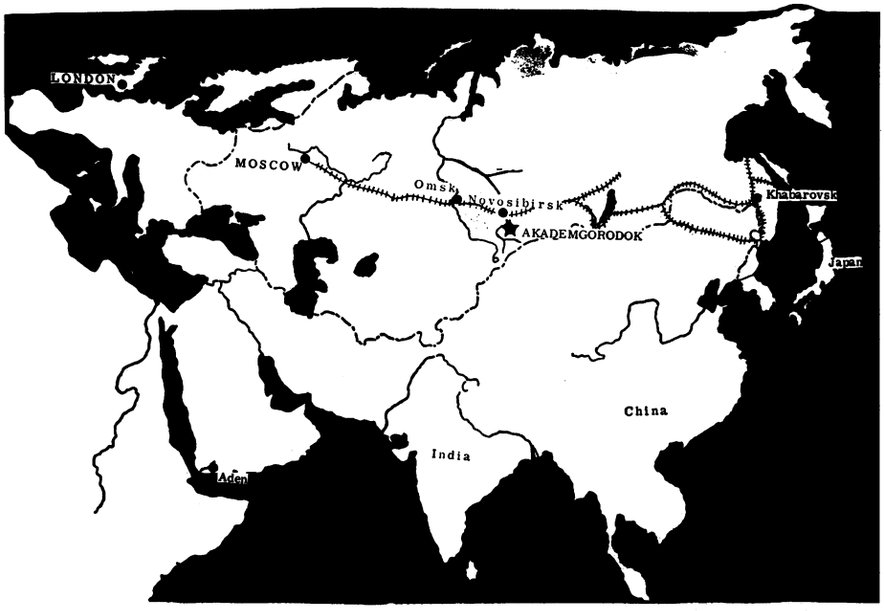

Fig. 1. Location of Akademgorodok.

Fig. 2. Opera house in Novosibirsk.

Fig. 3. Institute of Nuclear Physics.

Residential, Cultural, and Recreational Facilities

During our trip to the Soviet Union in the spring and early summer of 1964 (*2*) we spent several days in the Novosibirsk area and had the opportunity of meeting the resident scientists, visiting them in their homes, and participating in some of their cultural and recreational activities.

Akademgorodok is surrounded by a dense growth of tall pine, fir, and birch trees, which, we were told, has been left untouched to provide a pleasant vista and recreational area for the inhabitants. In the city plan, the existing shrubs and trees were left to form a decorative border of greenery around the buildings and along the streets.

One section of Akademgorodok is set aside for four-story apartment buildings (Fig. 4) and single-family housing units for the scientific staff. The larger of the family houses (Fig. 5) are reserved for members of the Academy and for senior scientists. The chance to live in these private homes is an enticement for scientists considering a move to the Science City, as such facilities are generally not available elsewhere. We were also told that the camp now being occupied by construction workers will eventually be turned over to the maintenance crew when the city is completed.

Almost all residential and scientific buildings are of prefabricated-concrete-slab construction. They appeared adequate, but looked older than their actual age and were of an architectural style

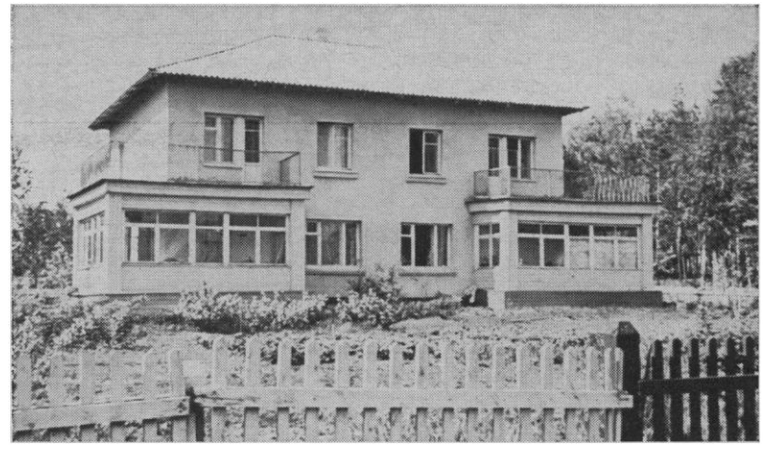

Fig. 4 (left). Apartments in Akademgorodok. Fig. 5 (above). A typical one-family house for members of the Academy or for senior scientists.

which made them seem outdated in comparison to recent Western scientific and residential structures.

In their leisure hours many scientists attend operas, plays, ballets, and concerts given in Novosibirsk. Akademgorodok itself has lecture halls where some members of our delegation heard the poet Robert Rozdhevtvensky recite a moving poem about the death of President Kennedy, written during the poet's visit to the United States in November 1963. In another verse he lambasted the Russian department of the New York University!

Akademgorodok has short, hot summers and long, severe winters when temperatures below −28°C are common. Because of its latitude (the 55th parallel), the city remains light in the summer until 9 or 10 o'clock in the evening, while in the winter the sun sets early in the afternoon.

In summer there is swimming and water skiing on nearby Lake Ob, a body of water 200 kilometers long made by the construction of a dam which supplies electricity to both Akademgorodok and Novosibirsk. Foreign visitors are often treated to a ride around the lake on two special sightseeing boats, called *Science I* and *Science II*. Vice President Nixon, who was one of the few Americans allowed to visit the city before the arrival of our delegation, was taken on such a trip. Along the lake shore are numerous wooded areas used by picnickers. Some of the hardier inhabitants have formed a "polar bear" club for winter swimming. For others, there are cross-country ski trips, skating, and tobogganing.

Road to Excellence

Undoubtedly Akademgorodok's important accomplishment is its educational program designed to develop the human potential of Siberia. The unique, large-scale selection process brings to the Science City gifted students whose abilities otherwise might not have been discovered. These students are expected to engage in independent research at an earlier stage than students in other Soviet science training centers do, and many have published their own work by the time they finish their university training. The cooperative atmosphere, which we witnessed, provided by the close working together of the various educational facilities seemingly gives continuity to the educational process.

Lord Snow has posed the problem of science and government very cogently, and it is our impression that as far as the relationship of the scientists to the government is concerned, the pervading tone in the Science City differs from that of the older academic establishments in the U.S.S.R. All members of the delegation felt that the Science City, created in an undeveloped area far from other cultural centers, should be regarded as an interesting experiment which, in concept if perhaps not fully in practice, makes higher education available to individuals whose potentials would otherwise go unrecognized. They felt that these aspects of the experiment may well provide some answers to the educational needs of other societies as well.

Notes

1. The name "Akademgorodok" literally means "Academic Town," but our designation "Science City" seemed more appropriate in view of the scope of its functions.
2. For a summary of the mission, → *Science* **147**, 1114 (1965). The views expressed in this article are solely those of the authors and do not necessarily reflect the opinion of the Public Health Service or the U.S. Department of Health, Education, and Welfare.