On the Prospects of Trilateral Science and Technology Cooperation Between the Russian Federation, the Republic of Korea and North Korea

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In spite of the temporary suspension of inter-Korean dialogue and economic exchanges between Seoul and Pyongyang, there is no doubt that in the nearest time both sides will have to resume contacts. It becomes obvious that there is no alternative to cooperation between the two Korean states and that this cooperation is the only condition of peace and security on the Korean peninsula.

The prognosis of the prospects and space of rapprochement between South and North Korea and of the scale and potential of their further economic cooperation needs an accurate evaluation of the science and technology basis of North Korea and of the professional level of North Korean scholars and engineers, who are playing a decisive role in the economic development of the country. Some foreign (including South Korean) publications quite often repeat oversimplified and rather underestimated assessments of North Korea's science and technology potential.

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Some foreign experts are claiming that under the current difficult economic situation North Korean science has practically collapsed and is not able to produce new ideas.

The real situation is far from these assessments. It goes without saying that the serious economic crisis has negatively affected North Korean science. Last year, contacts by North Korean scholars with outer world declined sharply. The lack of foreign currency forced North Korean authorities to minimize the purchase of foreign technology and equipment and to turn down participation in many international scientific projects. But, taking into consideration these facts, it is necessary to remember that in spite of all the difficulties North Korea keeps a rather developed potential of science and technology, created mainly owing to the support and assistance of the former Soviet Union.

In developing the scientific and technological potential of North Korea, an agreement on science and technology cooperation between the former Soviet Union and North Korea, signed in February 1955, played a significant role. It stipulated, in particular, the transfer to North Korea of the latest Soviet technological documentation, exchange of relevant information, and sending Russian specialists to Pyongyang for technical assistance.

By the end of the 80s the former Soviet Union had transferred to North Korea more than 3,000 sets of different technical documentation in the spheres of geology, machinery, metallurgy, chemistry, the food industry and fisheries, power engineering and agriculture. Soviet planning and design organizations and academic institutions provided North Korea with the necessary documenta- tion for 193 objects of capital construction, more than 700 blueprints of machines and equipment, and more than 2,000 sets of technical documents, including materials from different science and research institutions. In the machinery construction industry alone, the Soviet technological documentation was used for the production of several dozen kinds of machines and trucks, including "Sungni-58" and "Chajuho" trucks, "Kyongseng" cars, "Chollima" tractors, vessels and vessel-engines,

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excavators, bulldozers, boring machines, compressors, electric motors, generators and other equipment. Technology developed in the former Soviet Union is currently being used in many branches of North Korean industry, including the chemical industry and metallurgy, extraction and enrichment of minerals, construction and machine-tool construction. The North Korean side also received many samples of industrial and agricultural products, as well as nearly 6 thousand different standards, used for establishing in North Korea a National Standards System.

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In accordance with a bilateral agreement signed in September 1959, the former Soviet Union also rendered to North Korea technical assistance in the creation of the basis for nuclear power engineering and peaceful use of nuclear energy. In particular, Pyongyang was provided with support for construction of a research nuclear reactor at Pyongyang University, and in equipping a radiochemical laboratory and laboratory of nuclear physics.

Although the North Korean nuclear energy sector can't be compared with the South Korean nuclear energy industry, Pyongyang has a substantial basis for further development in this area. The main science and research centers in this field are the experimental nuclear physics laboratory at Pyongyang University and the laboratory of the Radiochemistry Institute in Yongbyon. There are also such industrial nuclear energy facilities as fuel cores (rods) production plant and uranium mines in Pak'chon and Pyongyang and two uranium enrichment plants.

It is also necessary to take into consideration the rather high professional skill of North Korean scholars and engineers, who received education and training in the former Soviet Union and other countries. More than four thousand North Koreans underwent training in different fields of science and technology and almost one thousand North Koreans have received postgraduate education in the former Soviet Union.

In the 70s and 80s many Russian and North Korean colleges, universities and research institutions signed agreements on cooperation. In April 1986, the Soviet Academy of Science and the

North Korean Academy of Science concluded an agreement on cooperation and an exchange program for 1989-1990. In December 1986, North Korea became a member of the International Center for Scientific and Technical Information. Russian and North Korean scholars conducted joint research works on Pacific Ocean ore zone, soil microbiology, and the former Soviet Union rendered assistance to North Korea in establishing large scientific laboratories and science centers. The geologists of the two countries prepared a scientific work entitled "Geological Structure and Mineral Resources of the Northeastern Part of the DPRK and Southern Part of Primorye Territory of Russia."

In accordance with the bilateral fishery agreement the former USSR and North Korea regularly exchanged information and research materials in the fields of biology, mineral resources, technology of fisheries, port operation and other important issues. North Korean scholars are still participating in research works at Russia's Dubna nuclear research center, keeping contacts with leading Russian science and research institutes.

It is worth noting that some results of the research done by North Korean scholars were also used in the former Soviet Union. Thus, Soviet side received from North Korea technical documentation connected with production of iron-coke, polyvinyl alcohol (spirit), fish processing, cultivation of agricultural crops and some medicine plants (such as ginseng). The Russian side also received samples of the seeds of frost-resistant and high-yielding fruit and berry plants.

Science and technology cooperation between Russia and North Korea also proceeded (though in limited scale) after the collapse of the Soviet Union. In April 1996, the first meeting of the Intergovernmental Commission on economic, trade and science and technology cooperation between the Russian Federation and the DPRK was held. Alongside with other issues, both sides discussed the prospects of cooperation in the reconstruction and exploitation of the Kim Chaek metallurgical complex in Chongjin, the Taedongang storage batteries plant, enamel-wire plant, bearing plant, microelectric engines plant and the

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Songjin steel mill.

The participants of the meeting also discussed the program of scientific and economic cooperation between the Ministry of Science of the Russian Federation and the North Korean state Committee on Science and Technology for the period of 1995-1997. In order to develop the legal basis for bilateral cooperation it was decided to speed up the preparation work on the draft of an intergovernmental agreement on promotion and mutual protection of investments and an agreement on the avoidance of double taxation on income and property. The North Korean side also offered to conclude an intergovernmental agreement on cooperation in the sphere of agriculture.

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Keeping on science and technology ties with North Korea, Russia is also developing mutually beneficial cooperation in this field with South Korea. In spite of the relatively short history of Russian-South Korean relations, both countries have made good progress in many spheres of scientific and technological cooperation. Science and technology cooperation is an important part of the general complex of relations between Russia and the Republic of Korea. It has become tradition to hold regular meetings of the Russian-Korean Joint Committee on Science and Technology Cooperation, chaired by the heads of the national agencies responsible for science and technology at the federal level.

During the previous five meetings the Joint Committee adopted overall 94 research and development projects in the most perspective areas. Now this list comprises 79 projects. The most actively and successfully implemented projects are the following: laser technologies in most diverse areas of application and laser radiation-control systems, creation of diamond-like structures and coatings, development of new materials with specific properties for application in space engineering and others.

One outstanding event which attracted keen interest in the academic and business circles of the Republic of Korea was the exhibition-seminar "Advanced Technologies of Russia," organized in May 1993. At that exhibition, 50 technologies, selected according

to the requirements of the Korean market, were displayed. During three days of demonstration, the exhibition drew about four thousand industrial experts, and representatives of business circles, scientific and research centers of the Republic of Korea. Some of the submitted technologies became a subject for further cooperation.

One of the key issues in the progress of science and technology cooperation between Russia and South Korea during the last years is the establishment and successful operation of joint Korean-Russian research centers in the territory of the Russian Federation on the basis of the leading Russian scientific organizations. This new form of improving integration in science and technology cooperation between the two countries have proven to be practically efficient.

Taking into consideration the unique position of the Russian Federation, having developed science and technology ties with both Korean states, it sounds quite realistic for these three countries to think over the possibilities of developing trilateral science and technology cooperation in some important areas.

Of course, a primary and necessary technical precondition of science and technology cooperation between the South and the North is the harmonization of the national standard systems of both Korean states, which should be adapted to international standards. Based on coherent standards systems, including national measurement standards, industrial standardization and so on, economic exchanges between South and North Korea could become more reliable and promoted even more with confidence in measurement and standardization of the goods in the process of inter-Korean trade. Considering the rich experience and long history of science and technology cooperation between Russia and North Korea and the successful cooperation in the field of industrial standardization between the Russian Federation and the Republic of Korea, Russian side could act as a coordinating body for contacts between the national standard organization of North Korea, the Central Institute for Quality and Metrology (CIQM), and the South Korean Research Institute of Standards and Science (RRISS).

The harmonization of the national standard systems of South and North Korea could substantially increase the possibilities of North Korea's participation (together with Russia and South Korea) in multilateral international projects in Pacific region. In particular, it could deal with problems such as monitoring global changing and natural disasters, unification of legal acts on the issues of gas and liquid wastes of industrial enterprises, and the creation of new telecommunication nets.

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An important direction of trilateral science and technology cooperation between the Russian Federation, the Republic of Korea and North Korea may become interaction on the issues of environmental protection and rational utilization of biological resources of the Eastern Sea. Joint scientific expeditions in the Eastern Sea could help eliminate all the fears concerning contamination of this sea by radioactive waste.

Considering the geographical proximity of South and North Korea to the Russian Far East and Siberia, it seems quite realistic to discuss the possibility of joint research projects between the scholars of the Far Eastern branch of Russia's Academy of Science (in Vladivostok) and scholars from South and North Korea. Mutually beneficial cooperation can be developed in such areas as mathematics, theoretical and applied physics, computer technologies, new materials, the theory of management, chemistry and chemical technologies, optical instruments, and biotechnologies, among others.

It also seems to be an interesting and promising idea to establish trilateral science and research centers on the territory of Russian institutes and universities in the Russian Far East and Siberia. In this connection, it is worth noting successful cooperation by some South Korean regional research institutions with Russian side. The recent seminar on the problems of Russian-South Korean science and technology cooperation, held by Ulsan University in November 1996, clearly demonstrated the huge potential of joint research works between this university and

research centers of the Siberian region. During the last five years Ulsan University has managed to establish good relations and contacts and concluded agreements on scientific and technical cooperation with Novosibirsk State Technical University (Faculty of Radiotechnics, Electronics and Physics), Tomsk Polytechnical University, and Tomsk State University as well as the Siberian Branch of Russian Academy of Science. According to these agreements both sides will carry out research works, participate in different science conferences in Russia and Korea, exchange scientific and technical information, and exchange researchers, post-graduate students and masters in the process of joint projects. Invited professors from the universities of the two countries will deliver lectures on the modern trends of science and technology.

Probably, North Korean researchers could also be engaged in joint academic science and research programs with Russian and South Korean colleagues.

The author of this article has been working for many years in the sphere of the relations between Russia and North Korea and Russian-South Korean cooperation and clearly understands that working out and launching trilateral science and technology cooperation projects will require not only the political will of the leaders of these three countries, but also the strong efforts of many people. However, this process seems to be inevitable, because only through dialogue and contacts can reliable guarantees of peace and security on the Korean peninsula be achieved. EKR