# Hermit Surfers of P'yongyang

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> **"The Internet . . . serves in North Korea as a pillar supporting Asia's most authoritarian government."**

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The Internet, touted in much of the world as a vehicle for personal liberation, serves in North Korea as a pillar supporting Asia's most authoritarian government. The Democratic People's Republic of Korea (DPRK) has embraced the World Wide Web as the latest means of acquiring, processing, and disseminating the foreign technical information required for domestic research and development, while at the same time barring the door against information contrary to its ideology. From P'yongyang and sites outside the capital, researchers surf the Web to acquire the latest technical data.

Meanwhile, overseas Koreans, particularly those residing in Japan, gather for their "fatherland" vast amounts of information with an ease unimaginable ten years ago. Inside North Korea, an "Intranet" serves as a means to disseminate technical information to research institutes, factories, and schools throughout the country. Accessing the latest foreign data on line from their place of work, North Korean researchers remain under the control of the authorities. The Internet thus limits the risks of foreign defection or ideological infection inherent in sending scientists abroad to study or attend international conferences.

In effect, a regime with a reputation for covert operations is also using open-source intelligence (OSINT) to pursue its interests. North Korea's military and intelligence units, given the history of the Korean War and postwar paramilitary and covert intelligence operations in South Korea and elsewhere, have made a deep impression on popular culture and specialists alike, from the South Korean spy movie *Shiri* (*Swiri)* to Joseph Bermudez's books on special forces. This article elaborates on the less-well-known fact that North Korea also places great store in OSINT, searching the globe for technical information that can advance its domestic objectives.

### Separating Technology from Ideology

Exploiting the Internet is the latest development in a long global tradition of acquiring foreign technology while rejecting the ideology of its source. European scholars of the Middle Ages translated into Latin the works of Averroes (Ibn Rushd), Arzachel (Al-Zarqali), and other luminaries of the Arab world, whose knowledge of astronomy, medicine, and other sciences surpassed that of medieval Christendom. While embracing the scientific revelations of Arab civilization, Europe rejected the Islamic religion that constituted its foundation.

Asian rulers also have long accepted technical innovations from abroad while keeping out

ideas inimical to their political order. Particularly adept at this practice, the Japanese acquired the fruits of Chinese technology over the centuries, while still developing their own distinct civilization. The Japanese slogan "*wakon kansai*" (Japanese spirit, Chinese learning) expressed the path taken.

Even the arrival of the first Europeans in the 16th century failed to turn Japan from its course. From early in the 17th century to the latter half of the 19th century, Japan's rulers severely restricted contacts with non-Asians as a means of maintaining the political order. The Japanese banned Christianity, forbade Japanese to travel abroad, expelled all Europeans, save the Dutch, and confined those last Westerners to a remote trading settlement in Nagasaki. Echoing North Korea today, the Japanese learned of Western developments in science through foreign publications brought by the Dutch—in 1856, the government established an institute in Tokyo for the extraction of information from Western publications. The penchant for OSINT continued after Japan's emergence from isolation, with translations of Western works flooding the empire while the authorities kept the population within narrow political bounds. Having turned from China to the West, the empire of Japan now operated on the basis of "*wakon yosai*" (Japanese spirit, Western learning).

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Korea also displayed a talent early on for acquiring foreign knowledge while maintaining its own culture. The Korean elite, literate in Chinese, kept current with developments in the Middle Kingdom through the ages. In the 17th century, Matteo Ricci, J. Adam Schall von Bell, and other learned Jesuit missionaries introduced European science to China. Korea's Prince Sohyon, who came into contact with Fr. Schall during a period of Chinese captivity, returned to Korea with numerous Chinese translations of Western writings as well as terrestrial globes and astronomical charts. Under Western military pressure to end its isolation in the last half of the 19th century, Korea turned to OSINT for defense. The country built a modern warship armed with cannon based on descriptions in *Haiguo Tuzhi* (Illustrated Gazette of the Maritime Countries), a detailed account written by a Chinese official concerned with learning from the West. When American warships carrying over 600 men steamed into waters near Seoul in 1871 to force open the Hermit Kingdom, the Koreans fired the new cannon against the invaders.[1]

When Japan formally colonized Korea in 1910, the Korean elite turned from West to East to learn the latest in technology. Top Korean students attended university in Japan or received instruction in Japanese at academic institutions in Korea. They were the elite who led the industrial development of the peninsula following Japan's loss of empire in 1945. Kim Tong-il, for example, who made his mark in artificial textiles, spent the 1930s as a student of applied chemistry in the engineering faculty of Tokyo Imperial University before conducting research at a Japanese corporation. In the final years of World War II, he managed a factory of the Kyongsong Spinning and Weaving Company. After the war, he received a doctorate at Seoul National University and played a major role in the development of synthetic textiles in South Korea. North Korea's early scientific elite also included Dr. Ch'oe Sam-yol (a researcher at Japan's prestigious Institute of Physical and Chemical Research before becoming the first vice president of the DPRK Academy of Sciences) and Dr. Yi Sung-gi (a student and researcher of industrial chemistry at Kyoto Imperial University before leading the development of artificial textiles in North Korea).[2]

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[1] *Ch'oesin Inmyong Sajon* [Modern Biographical Dictionary] (Seoul, Korea: Minjung Sowon, 1997), p. 527; Yi Ki-baek [Lee, Ki-baik], Edward W. Wagner, trans., *A New History of Korea* (Seoul: Iljogak, 1984), pp. 241, 264, 297; and Bruce Cumings, *Korea's Place in the Sun* (New York and London: W. W. Norton, 1997), pp. 97-98.

**Developing the Information Infrastructure**

Tensions from the postwar partition of the Korean peninsula into Russian and American zones of occupation led to a devastating war five years later and the division of the peninsula to this day into two hostile governments. Science and technology in the two Koreas developed along different paths. South Korea, for the most part, followed the United States and Japan in building its science establishment. North Korea, influenced from the start by the Soviet occupation and the country's subsequent ties to the Soviet bloc and Communist China, built its S&T structure along Moscow's lines.

In 1948, the year North Korea was formally established, P'yongyang sent more than 60 students to study in the Soviet Union. The following year, the two countries concluded their first aid agreement. In 1953, on the heels of the armistice ending the Korean War, North Korea signed another accord with the Soviet Union and concluded successive agreements that year with Hungary, East Germany, Romania, Bulgaria, Poland, and China. Nearly 1,000 Chinese technicians arrived that same year to help rebuild the country. North Korea established a science academy, with subordinate branches and research institutes, along Soviet lines to direct civilian R&D projects. At the end of 1953, a delegation from the DPRK Academy of Sciences left to visit counterparts in the Soviet Union.[3]

> **"North Korea built its S&T structure along Moscow's lines."**

North Korea's exploitation of foreign technical information took a major step forward in 1963 with the establishment of the Central Scientific and Technological Information Agency (CSTIA) under the Academy of Sciences. The agency's mission, according to a monthly magazine, is "to collect, analyze, and process various data on advanced science and technology before sending them to every relevant field of the national economy." A listing of services in *Kisul Hyoksin*, the agency's monthly journal of technical innovation, included the searching, copying, and translating of information at customer request.[4]

According to *The People's Korea*, a newspaper published in Tokyo by an affiliate of the pro-DPRK General Association of Korean Residents in Japan (GAKRJ), the size of CSTIA's technical database makes it North Korea's "largest scientific facility."[5] While figures on budgets and personnel are lacking as yardsticks by which to validate that claim, CSTIA leads the pack in publishing technical information. In recent years, the agency has accounted for 30 of 48 S&T periodicals put out by the six main scientific publishers. The Science and Technology Publishing House came in second place with 13 periodicals.[6] An advertisement for CSTIA services in *Kisul Hyoksin* listed 15 technical bulletins dedicated to coverage of foreign S&T developments and a dozen others covering various aspects of science and technology.

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[2] *Modern Biographical Dictionary*, p. 89; and Pak Ch'an-mo, "Pinallon Palmyong han 'Yi Sung-gi' Paksa Segyejok Myongsong [Global Renown of Dr. 'Yi Sung-ki,' Who Invented Vinalon]," *Kwahak-kwa Kisul*, March 2002, pp. 26-27.

[3] Yi Chae-sung, *Pukhan-ul Umjiginun T'ek'unok'urat'u* [Technocrats Who Move North Korea] (Seoul: Ilbit, 1998), pp. 428, 454-56.

[4] *Kisul Hyoksin*, 5 January 1999. It is worth noting here that government organs involved in searching the world for technical literature, then providing copies and translations to national research institutes and enterprises to help resolve technical problems or enhance commercial competitiveness are found around the world. CSTIA's equivalents in neighboring countries, for example, include the Japan Science and Technology Agency (http://www.jst.go.jp), the Institute of Scientific and Technical Information of China (http://www.istic.ac.cn/Eng/index_en.html), and the Korea Institute of Science and Technology Information (http://www.kisti.re.kr).

[5] The agency is also known as the Central Information Agency of Science and Technology (CIAST). See Korea Today (February 20001) and "Strategic Plan for IT Revolution in DPRK," The People's Korea (25 August 2001), accessed at: http://www.korea-np.co.jp/pk. GAKRJ, for its part, is also known by its Japanese name, Chosen Soren.

[6] Yi Chae-sung, pp. 64-66. The other four publishers of S&T periodicals listed were the Agricultural Publishing House, Kim Il-song University, the Industrial Publishing House, and the Medical Science Publishing House.

**CSTIA Publications Listed in 1999**

*Chongbo Kwahak-kwa Kisul* [Information Science and Technology]
*Kisul Hyoksin* [Technology and Innovation]
*K'omp'yut'o-wa P'uroguram Kisul* [Computer and Program Technology]
*Kwahak Kisul Kaegwan Charyo* [Science and Technology Overview Data]
*Kwahak Kisul Munhon Ch'orok* [Science and Technology Literature Abstracts]
*Kwahak-Kisul T'ongbo Annae* [Science and Technology Bulletin Guide]
*Kwahak-ui Segye* [World of Science]
*Oeguk Kwahak Kisul T'ongbo* [Foreign Science and Technology Bulletin] series
- *Chollyok* [Electric Power]
- *Chonja Chadonghwa* [Electronics and Automation]
- *Hwahak* [Chemistry]
- *Kigye Kumsok* [Machinery and Metals]
- *Konsol* [Construction]
- *Kukt'o* [Land]
- *Kwangop Chijil* [Mining and Geology]
- *Kyonggongop* [Light Industry]
- Kyot'ong Unsu [Transportation]
- *Mulli, Suhak* [Physics, Mathematics]
- *Nongop* [Agriculture]
- *Saengmurhak* [Biology]
- *Susan* [Fisheries]
- *Suui Ch'uksan* [Veterinary Science and Animal Husbandry]
- *Uihak* [Medicine]

*Oeguk Kwahak Kisul Wonmun Charyo* [Foreign Science and Technology Texts]
*Sae Kisul Sosik* [New Technology News]
*Sae Kisul T'ongbo* [New Technology Bulletin]
*Silyong Kisul Charyo* [Useful Technical Data]

Source: *Kisul Hyoksin*, 5 January 1999.

**Science and Foreign Languages**

A review of CSTIA publications, particularly the foreign S&T bulletin series, reveals the importance of China, Japan, and Russia as sources of technical data, reflecting Korea's historical connections with these countries. Dictionaries also show P'yongyang's particular path to science. In the 1960s, the Academy of Sciences produced a monumental S&T dictionary in nine volumes. Its defining feature, reflected in the title, was a compilation of terms in seven languages: Korean, Chinese, Japanese, Russian, English, French, and German. The dictionary was updated and expanded in 1996. Grown to 18 volumes, it still maintained information in seven languages.[7] In contrast, South Korean technical dictionaries in general are bilingual works in Korean and English, a reflection of the dominant role that the United States has played in the development of South Korean science and technology.

The North Korean Academy's monumental dictionaries bear witness to the foreign language hurdles that the country's scientists and technicians must overcome. North Korean leader Kim Il-song, while conducting an on-site inspection of the Academy of Sciences in March 1983, tasked the institution with seeing that all scientists put more effort into studying foreign languages. In response, the academy began competitions for scientists to demonstrate the ability "to translate and comprehend completely the latest global trends in scientific development and the data of scientific research results."[8] Kim Il-song's instructions also reportedly account for the many translations and abstracts of overseas technical literature published by the academy.[9] Yi Ch'ung-guk, who defected in 1993 from the Nuclear and Chemical Defense Bureau of the Korean People's Army, recalls that he and other students at the elite University of Science in the late 1980s had free access to many foreign science journals and books, even

[7] Academy of Sciences, ed., *Ilgop-kae Kugo Kwahak Kisul Yongo Sajon* [Dictionary of Science and Technology in Seven Languages] (P'yongyang: Academy of Sciences Publishing House, 1968), and Academy of Sciences, ed., *Yoro Naramal Kwahak Kisul Yongo Sajon* [Multilingual Dictionary of Scientific and Technical Terms] (P'yongyang: Academy of Sciences Publishing House, 1996).
[8] *Nodong Sinmun*, 9 June 1998.
[9] Yi Chae-sung, p. 64.

those from Japan and the United States. He says the students tended to push themselves to learn several foreign languages. According to Yi, "In particular, Japanese was so popular that the thinking was that if you could not master Japanese, you would not be able to become a scientist."[10]

**Going Electronic**

In recent years, North Korea has expanded its exploitation of foreign technical information by embracing information technology (IT). In 1999, CSTIA began selling in CD-ROM format an electronic multilingual S&T dictionary based on the 18-volume reference work published in 1996. A new version, *Kwangmyong 2001*, appeared two years later. The agency also offers encyclopedias, databases, journals, theses, and other products on CD-ROM.[11] At the Grand People's Study House (GPSH), P'yongyang's equivalent to the Library of Congress, visitors can view CD-ROMs in an "electronic reading room." Reportedly, the GPSH has a computer catalogue room with "dozens" of terminals.[12]

The Internet has greatly enhanced the ease with which North Korea can acquire foreign data. Researchers can surf the Internet via a connection routed through the Ministry of Posts and Telecommunications.[13] The accomplishments of Dr. Hwang Tok-man, a researcher on the biology faculty of Kim Il-song University, illustrate P'yongyang's embrace of IT. Her research focus has been the structural and functional analysis of proteins, or proteomics. She also has explored the intersection of biology and information technology, compiling a "huge" structural database.[14] Using an IBM Aptiva S-series computer and data from the Protein Database of the US Department of Energy's Brookhaven National Laboratory, she and a colleague examined the structure-function relationships of cellulases, enzymes that break down cellulose. They used the Align, Clustal V, and FASTA programs to compare the amino acid sequences and exploited overseas protein sequence databases to study the molecular evolution of a nuclease, an enzyme that splits nucleic acids.[15]

**"The Internet has also eased the collection burden born by pro-DPRK Koreans living overseas."**

The Internet has also eased the collection burden born by pro-DPRK Koreans living overseas. An article on the Web site of the Korean Association of Science and Technology in Japan (KAST), part of the GAKRJ, describes the benefits of the Internet for KAST members who gather information in Japan for North Korea:

> *In Japan and other advanced countries of the world, the search for S&T literature has become extraordinarily convenient on account of the spread of the Internet. The memory is still recent of having had to go in the past to the National Diet Library, Patent Office, or a university library, searching for material and photocopying it. In order to obtain some items, one spent money on transportation, paid high copy*

[10] Yi Ch'ung-guk, *Kin Seinichi no Kaku to Guntai* [Kim Chong-il's Nuclear Weapons and Army] (Tokyo: Kodansha, 1994), p. 70.
[11] KAST, accessed at: http:// www.19.xdsl .ne.jp/ ~kwahyop/DPRK/NEWS.HTM.
[12] *Nodong Sinmun*, 21 February 2002.
[13] KAST Web site. According to media reports published in late 2003 and early 2004, a German businessman is to connect North Korea to the World Wide Web, using filtering software similar to that reportedly used by Beijing and Havana to control Internet use. See, for example, a report of 29 December 2003, "North Korea Discovers the Internet," accessed at: http:// australianit.news.au.com.
[14] *Minju Choson*, 21 July 2001.
[15] Hwang Tok-man and Kim Kwang-won, "Tanbaekchil Charyo Kiji Haesok e wihan Somyuso Punhae Hyoso-ui Kujo Kinung Yongwansong-ui Yongu (Che-il Po) [Structure-Function Relationships of Cellulases by Protein Database Analysis (Part 1)]," *Saengmurhak*, 14 April 1999, pp. 21-27; Hwang Tok-man and Kim Kwang-won, "Tanbaekchil Charyo Kiji Haesok e wihan Somyuso Punhae Hyoso-ui Kujo Kinung Yongwansong-ui Yongu (Che-i Po) [Structure-Function Relationships of Cellulases by Protein Database Analysis (Part 2)]," *Saengmurhak*, 14 July 1999, pp. 30-34; and Hwang Tok-man, Chong Sun-hwan, and Kim Kwang-won, "Nuk'ureaje P1-ui Punja Chinhwa e taehan Yongu [Research on Molecular Evolution of Nuclease P1]," *Saengmurhak*, 15 July 2000, pp. 8-13.

> **With the Internet, P'yongyang can promote scientific exploration while keeping researchers in country and under surveillance.**

*fees, and used up a day. If it were a case of materials necessary for one's own research, then one would be accustomed to searching for it. But there were probably more than a fe KAST members who toiled to find items requested by the Republic. That has given way to an era, in recent years, in which the necessary information can be had in abundance via one's own computer and stored without printing. For those who have toiled until now in gathering materials, the ease of collection is simply surprising.*[16]

It is impossible to determine the volume of foreign technical literature that KAST has acquired for North Korea, but the Grand People's Study House offers some idea of the organization's importance. In 1988, the GPSH opened the Aeguk Reading Room to showcase over 500,000 published materials donated from overseas Koreans, primarily KAST members.[17]

In addition to enhancing foreign collection capabilities, the Internet has made dissemination of data within North Korea easier. Researchers based outside the capital no longer need to travel to P'yongyang for necessary information. For example, members of the Academy of Sciences, located on the outskirts of the capital, have for years commuted into the city on a particular train that "serves the convenience of the scientists to frequent the Grand People's Study House and other organs."[18] Scientists now can access data of the GPSH, CSTIA, Kim Il-song University, and other data repositories via "Kwangmyong," the DPRK S&T Intranet developed in 1997. Kwangmyong consists of a browser, an e-mail program, news groups, a search engine, and a file transfer system, programs developed by CSTIA. The online version of CSTIA's *Kwangmyong 2001* dictionary allows on-screen translation.[19]

### The Internet and the Hermit Kingdom

While allowing researchers to use the Internet to keep current with global trends in science and technology, P'yongyang has been able to retain control over unwelcome political information. The government can promote scientific exploration while keeping researchers in country and under surveillance. Computers conducting Internet searches are more readily monitored than the photocopying machines that served to spread forbidden political tracts in the former Soviet Union. With Internet searches easily tracked and the penalties for political dissent grave, it is difficult to imagine scientists straying from technology sites. The same applies to the domestic Intranet, where technicians exchanging e-mail messages on political issues would run a serious risk of late-night knocks on the door by members of the security forces.

Information technology alone cannot guarantee the rule of Kim Chong-il or of his party. Yet, the ability to gather the latest technical information without sending people abroad or bringing Westerners in could help keep the political structure intact against a host of pressures. Much as Japan kept out foreign religious and ideological currents while importing Western technology, so P'yong-yang's authorities could use the Internet for their own policy of "*chohon yangjae*" (Korean spirit, Western learning).

It is a significant irony of our information age that open-source intelligence is contributing to the survival and development of one of the world's most secretive regimes.

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[16] KAST Web site. KAST has been known in the past in Japan as the Association of Korean Scientists and Technicians (AKSTJ). It has also been called by its Korean abbreviation, "Kwahyop."

[17] National Counterintelligence Executive, "Overseas Koreans Contributing Technical Literature to DPRK," *News & Developments* (September 2001), accessed at: http://www.ncix.gov/news/2001/sep01/html#article2.

[18] "In Brief," *Democratic People's Republic of Korea*, September 1998, p. 32.

[19] *The Pyongyang Times*, 31 March 2001 and 10 February 2001.