

This picture, taken on 1 July 1950, shows a U.S. Air Force bombing raid on the railroad bridges across the Han-gang in Seoul. The damaged road bridge can be seen to the right. What may be N2P ferries being used by the 1st Engineer Regiment can be seen further upstream (i.e., to the right) of the road bridge. (USAF)

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KPA Engineer River Crossing Units During the Fatherland Liberation War, Part 2

By Joseph S. Bermudez Jr.

1st Engineer Regiment¹

In most early wartime intelligence reporting concerning this unit it is identified as the 576th Engineer Regiment. This is misleading as “576” was the unit’s “army unit” or code number while its official designation was the 1st Engineer Regiment.² This confusion arose from the KPA security practice of normally referring to its own units as the “nth KPA Army Unit” rather than by their actual designations.

Subsequent intelligence reporting during and after the war correctly identified the unit as the 1st Engineer Regiment.³

Establishment

The 1st Engineer Regiment was established at Kan-ni , approximately 12 km north-northwest of P’yongyang, in September 1948 by expanding the Engineer Bureau’s training battalion to regimental size {1, refer to the map below}. Prior to this the training battalion had constituted the sole specialized engineer asset within the newly established KPA. The initial mission of the 1st was to serve both as the army-level engineer reserve and as a training unit for engineer officers and personnel. The unit would also soon develop into the KPA’s primary engineer river crossing unit.

During the year-and-a-half period from its establishment until late June 1950, the 1st absorbed new personnel and equipment and engaged in intensive combat engineer and specialized engineer training under the supervision of Soviet engineer advisors attached to the Engineer Bureau.

The personnel assigned to the Engineer Bureau during the pre-war years were generally better educated than the

average KPA recruit. Many had served in the Chinese People's Liberation Army (some having attended the engineer School at T'ung-hua) or the Imperial Japanese or Soviet Armies during World War II. The training they received under the guidance of the Soviet advisors appears to have been quite thorough and was intended to develop a capable and experienced cadre of engineer officers and noncommissioned officers who would subsequently go on to establish engineer companies or battalions within the newly forming divisions and regiments.

After completion of an year-long initial training cycle, the regiment's personnel received practical engineering experience when the unit was assigned to construct barracks and other military installations in the P'yongyang area.

On about 1 June 1950, and in preparation for the upcoming invasion of the ROK, the 1st Engineer Regiment moved from Kan-ni to Chasan for 15 days of maneuvers {2}. Chasan lies 30 km to the northeast on Kan-ni within a wide flat valley along the upper Taedong-gang (i.e., Taedong River). This location was ideal for river crossing and bridging operations and it is likely that this was the primary focus of these maneuvers.

Sometime between 16-23 June the 2nd Heavy Pontoon and 3rd Light Pontoon Battalions are reported to have been detached and assigned to the newly established Front Headquarters (a.k.a., Front-line Headquarters or Forward Headquarters) to provide specialized river crossing engineer support. It is likely that the battalions moved to the Namch'onjom-Songbyon-ni in preparation for the invasion {3}.

Organization

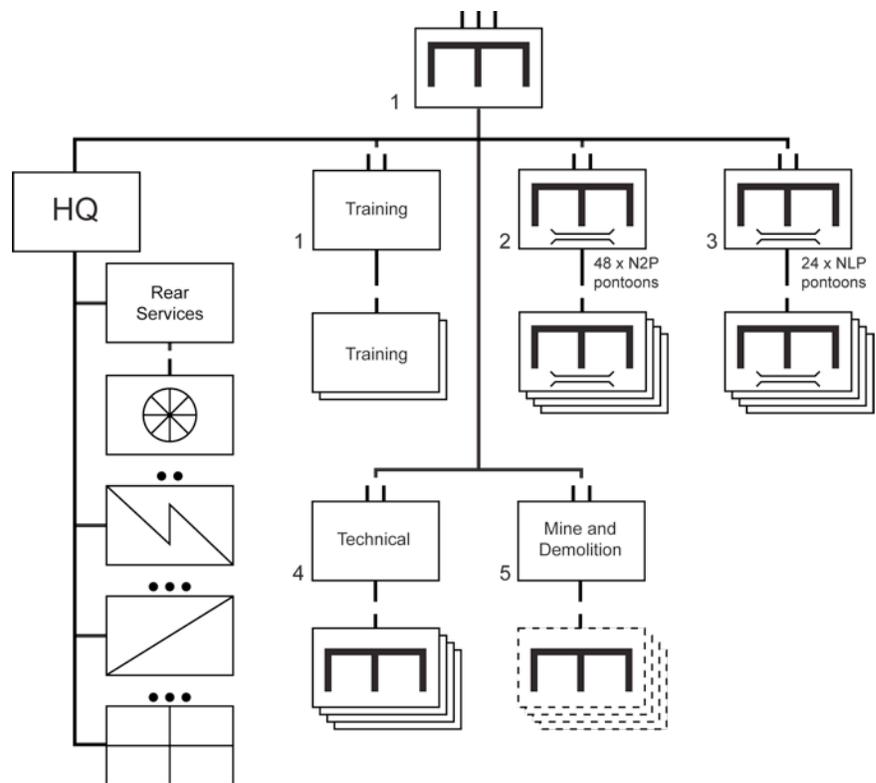
At the time of the 25 June 1950 invasion the 1st Engineer Regiment was commanded by Senior Colonel Cho In-mo (a.k.a., Cho Ing-mo). He was assisted by a staff of four officers: the regimental political officer (with the rank of lieutenant colonel); Lieutenant Colonel Nam Chang-man, regimental operations officer; Lieutenant Colonel Lee Chin-gun, regimental technical officer; and Major Hyon Malchin, chief of rear services. The regiment had a strength of approximately 1,500 personnel and was organized into a regimen-

tal headquarters, training battalion and four specialized engineer battalions—heavy pontoon, light pontoon, technical and mine and demolition.⁴

Regimental Headquarters: The regimental headquarters consisted of the command staff, rear services section with a transportation company, signal section, reconnaissance platoon and medical platoon. The rear service section included a transportation company equipped with approximately 70 Soviet trucks, which were normally allocated to the various battalions to carry river crossing and other heavy equipment. The signal section was staffed by approximately 1 officer and 9 enlisted, medical and reconnaissance platoons were staffed by approximately 1 officer and 20 enlisted each.

1st Battalion (Training Battalion): Available information indicates that the 1st or Training Battalion, was commanded by Major No Se-kyu. It consisted of two companies, each with a nominal strength of approximately 80 personnel. The battalion appears to have been equipped with hand tools only.

2nd Battalion (Heavy Pontoon Battalion): The 2nd or Heavy Pontoon Battalion was commanded by Major Lee



1st Engineer River Crossing Regiment, 30 June 1950

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Ma-ka. It had a strength of approximately 450 personnel and was organized into four identical pontoon bridge companies.⁵ The battalion was equipped with a total of 48 Soviet N2P heavy pontoons, five motor boats, two amphibious vehicles, seven mine detectors (probably VIM-203) and the usual complement of engineer hand tools. All personnel assigned to the battalion were armed with Soviet small arms.

3rd (Light Pontoon Battalion): The 3rd or Light Pontoon Battalion was commanded by Major Ro Myon-son. It had a strength of approximately 250 personnel and was organized into four identical pontoon bridge companies. The battalion was equipped with a total of 24 light NLP plywood pontoons and the usual complement of engineer hand tools. As with the 2nd Battalion, all personnel assigned to 3rd Battalion were armed with Soviet small arms.

4th (Technical Battalion): The 4th or Technical Battalion was commanded by Major Chun Jin-chu. It had a strength of approximately 450 personnel and was organized into a headquarters and four technical companies: water supply company—equipped with electric water pumps; camouflage company—equipped with standard camouflage items; electric company—equipped with 10 portable power plants; and a machinery company—equipped with lathes, welding machines, grinders, pile driving equipment and other power tools and specialized equipment.

5th (Mine and Demolition Battalion): Practically no information is available concerning the 5th or Mine and Demolition Battalion other than it specialized in the laying and clearing of land mines and in demolition work. The battalion's strength has been estimated at between 250-450 personnel. It was equipped with antipersonnel and antitank mines and with a number of VIM-203 mine detectors.

Wartime Operations

Although contemporaneous intelligence reports state that the 2nd Heavy Pontoon and 3rd Light Pontoon Battalions were attached to the I and II Corps respectively sometime between 16-23 June this may be somewhat inaccurate. A piecing together of various records suggests that sometime during 16-23 June the units were subordinated to the Front Headquarters and probably moved to the area of Namch'ŏn-jom area {3}. They were assigned the mission of supporting I and II Corps units in crossing the Imjin-gang (i.e., Imjin River) and Han-gang (i.e., Han River) during the first phase of the upcoming invasion. For this mission the 2nd Pontoon Battalion and one company from the 3rd Pontoon Battalion were placed in support of the 6th Infantry Division, while the 3rd Pontoon Battalion (minus one company) was to support the 1st Infantry Division.⁶ It was probably only after these operations that the battalions were attached to the I and II Corps Headquarters. On 25 June both battalions advanced behind the leading infantry divisions.

There is some confusion concerning the 2nd Heavy Pontoon Battalion's first combat operation. U.S. intelligence re-

ports and Soviet histories of the war agree that on 25 June the battalion was engaged in a ferry operation on the Han-gang.⁷ This operation took place at Yongjong-ni, approximately 30 km north-northwest of Seoul, in support of elements of the I Corps (probably elements of the 14th Infantry Regiment, 6th Infantry Division) {4}. The accounts provided by both sources, however, do not necessarily support each other and appear to confuse details of this operation with bridging operations conducted by the attached company from 3rd Light Pontoon Battalion. The 2nd Heavy Pontoon Battalion is likely to have been engaged at Yongjong-ni through 26 June.

Following the capture of Kaesong the 13th and 15th Infantry Regiments of the 6th Infantry Division advanced south along the Kaesong-Seoul highway to the north bank of the Imjin-gang {5}. Here they found that all the bridges had been destroyed by withdrawing ROK Army units. The division's engineer battalion immediately commenced preparations for bridging the river and the attached company from the 3rd Light Pontoon Battalion was ordered forward. This unit constructed an NLP pontoon bridge to carry the division's heavy equipment. The limited load-carrying capacity of this bridge was supplemented by confiscated civilian boats and barges and the organic river crossing equipment of the division's engineer battalion (e.g., A3 pneumatic floats and NLP pontoons assembled into ferries). Little opposition was encountered during the crossing and the division's troops and most of its heavy equipment were across the river by noon on 26 June. It is likely that the light pontoon company remained here at least temporarily to assist follow-on units cross and to repair the bridges across the river.⁸

On about 25-26 June, the remainder of the 3rd Light Pontoon Battalion, which was operating in support of the 1st Infantry Division reached the Imjin-gang {5} also. Here, just north of Munsan, the battalion apparently constructed another pontoon bridge which was completed sometime on 26 June. Due to the proximity of the battalion's bridging operations to those of its detached company, it is likely that the entire battalion worked together at the Imjin-gang crossing sites.⁹

Sometime on 26 June the 13th and 15th Infantry Regiments, which were now assembled on the south bank of the Imjin-gang, advanced to the southwest. The units followed the east bank of the Han-gang until they reached a point due east of the Kimp'ŏ Airfield. It is believed that elements of the 3rd Light Pontoon Battalion accompanied these advancing units since it is reported that the regiments conducted a crossing of the Han-gang using the same techniques and equipment as had been employed on the Imjin-gang {6}. Hours after crossing the Han-gang the 13th and 15th Infantry Regiments captured Kimp'ŏ Airfield.¹⁰ It appears that shortly after assisting the Han-gang crossing operation that the 3rd Light Pontoon Battalion was attached to the II Corps as it

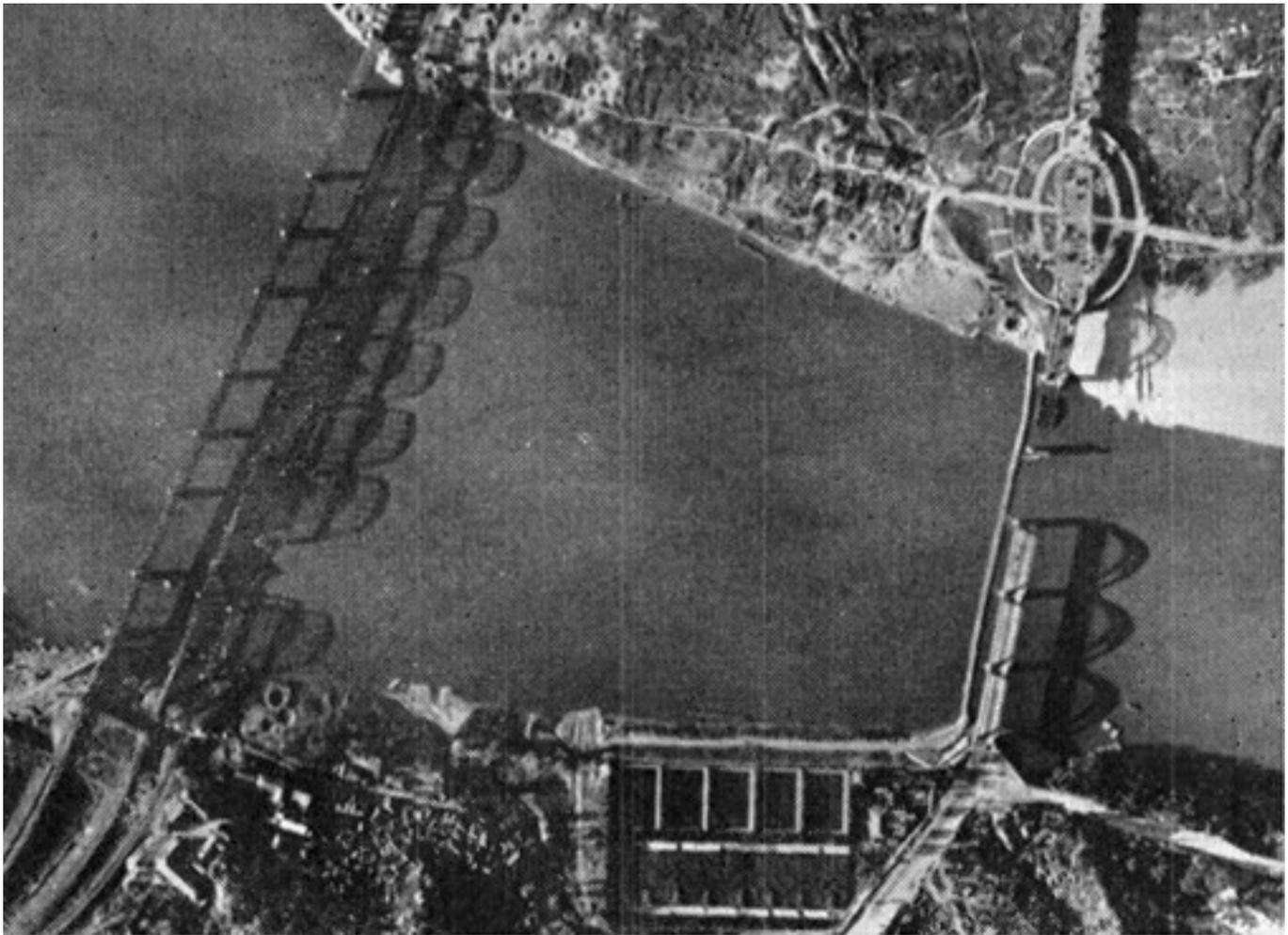


advanced to the southeast.

Meanwhile, following its operations in the Yongjong-ni area the 2nd Heavy Pontoon Battalion moved southeast towards Seoul where it would conduct its second bridging operation.

In 1950 there were three rail bridges and one road bridge across the Han-gang in Seoul connecting the city on the north bank with Yong-dongp'o on the south bank. These bridges, especially the road bridge, were major objectives for the 3rd and 4th Infantry Divisions and the 105th Tank Brigade as they pushed through the capitol. The importance of strategic bridges in general was clearly understood by the General Staff Department prior to the war and Reconnaissance Bureau troops disguised as civilians were dispatched ahead of the attacking forces to prevent their destruction.¹¹ Remarkably, no provision were apparently made for securing the Han-gang bridges and they were partially destroyed by

withdrawing ROK Army units. On 29 June, after establishing the Front Headquarters command post in the basement of the Capitol Building in Seoul, the Engineer Bureau commander, Senior Colonel Pak Kil-nam and Operations Bureau commander Maj. Gen. Yu Song-ch'ol rushed down to the Han-gang to assess the damaged bridges.¹² Following this assessment the 2nd Heavy Pontoon Battalion was ordered forward to assist the 4th Infantry Division and 105th Tank Brigade cross the Han {7}. The following morning, on 30 June, elements of the 4th Infantry Division conducted an assault crossing of the Han-gang using local craft and established a bridgehead to allow the Heavy Pontoon Battalion to begin operations. Ongoing air strikes against the bridges would not only further damage the railroad bridges but also slow crossing operations. During 2-7 July the Heavy Pontoon Battalion transported additional elements of the 4th Infantry Division across the Han-gang using ferries and lo-



This picture, taken in mid July 1950, shows the pontoon bridge constructed across the Han-gang by the 2nd Heavy Pontoon Battalion immediately to the west (downstream) of the road bridge. Note the approaches to the pontoon bridge constructed on both banks. The damaged railroad bridges can be seen further to the west. Compare this photo with the early one presented on page 1. (USAF)

cal craft, temporarily repaired one of the rail bridges using sheets of iron and sandbags and constructed a pontoon bridge adjacent to the footbridge using N2P pontoons and impressed civilian labor. While small elements of the 109th Tank Regiment, 105th Tank Brigade were able to cross on 3 July using the repaired rail bridge the majority of the unit crossed the following day using the pontoon bridge.¹³ It appears that shortly after this operation that the 2nd Heavy Pontoon Battalion was attached to the I Corps. It would remain in support of the I Corps from this time through the battle for the Pusan Perimeter.

It is interesting to note that while most sources identify the bridge as being constructed using N2P pontoons a intelligence report dated 22 January 1951 states that,

“The ponton [sic] bridge at Soul [sic] was constructed from sectional ramp extensions (sometimes call pontoon causeways) of U.S. Navy origin, probably from stocks used in Inchon in 1945 and left in that area. The NKPA used six of these extensions to assemble the bridge. One spare extension was kept lying a few feet offshore and upstream of the bridge, probably for ease in emergency repairs.”¹⁴

Assuming that both this report and earlier intelligence reports based upon prisoner-of-war interrogations are correct, then it would appear that the bridge originally constructed during 1-3 July utilized N2P pontoons, but these were subsequently replaced by salvaged U.S. manufactured equipment so that the 2nd Heavy Pontoon Battalion could support the I Corps' advance south.

During 1-7 July the remainder of the 1st Engineer Regiment—minus the 1st Training Battalion—moved to Seoul with an advance detachment from the Engineer Bureau. While no specific documentation has yet come to light it is believed that several of the Engineer Bureau's Soviet advisors accompanied the move to Seoul.

It appears that with the movement of the 1st Engineer Regiment to Seoul the 1st Training Battalion remained at Kan-ni. Here it was once again subordinated to the Engineer Bureau with the mission of training replacement engineer personnel and units. The swift establishment and training of the 2nd Engineer Regiment (see below) in August was likely only accomplished by the assistance of a experienced training cadre of the 1st Training Battalion.

While the 1st Engineer Regiment headquarters was to remain in Seoul elements of the 4th and 5th battalions were frequently detached to provide specialized engineer support to the I and II Corps. One of the more interesting aspects of the 1st Engineer Regiment's being stationed in Seoul was the conversion of an automotive repair shop in the city to produce N2P pontoons. When the UNC forces recaptured the city in September 1950 this shop had completed 12 pontoon sections and another 12 were approximately 90% completed. It is assumed that this production took place under the direction of the regiment's rear services section.¹⁵

During 14-15 July the 2nd Heavy Pontoon Battalion furnished river crossing support to the I Corps' 3rd and 4th Infantry Divisions for three unsuccessful crossings of the Kum-gang (i.e., Kum River) north of Taejon {8}. The following day, 16 July, the 3rd and 4th Infantry Divisions successfully crossed the Kum-gang using an “underwater bridge” constructed by the 2nd Heavy Pontoon Battalion and divisional engineer elements in the face of repeated UNC air attacks.

During August 1950, the Front Headquarters established an advanced command post at Kumch'on to direct the assault on Taegu and the Pusan Perimeter {9}. To support this effort the 1st Engineer Regiment dispatched an advanced staff to the command post. Senior Colonel Cho In-mo, however, still remained in Seoul.

Between 24 July–28 August 1950 the 2nd Heavy Pontoon Battalion supported various divisions of the I Corps in their repeated attempts to penetrate the UNC defenses along the banks of the Naktong-gang (i.e., Naktong River) {10}. With its organic N2P heavy pontoons, the battalion constructed bridges and ferries across the river in the sectors of the 2nd, 4th, 9th and 10th Infantry Divisions. It is believed to have also constructed, or assisted in the construction, of “underwater bridges” at Hyopch'on {11} across the Hwang-gang (i.e., Hwang River) in support of the 2nd Infantry Division (and later the 16th Tank Brigade), and east of Uiryong across the Nam-gang (i.e., Nam River) and south of Sang-ni {12}, across the Nam-gang in support of the 7th and 9th Infantry Divisions.¹⁶ The battalion continued to operate in support of the I Corps until the middle of September.

Although details concerning the 3rd Light Pontoon Battalion's movements and operations after 1 July are lacking, elements of the battalion are believed to have reached the northern portion of the Pusan Perimeter by the end of the month with various elements of the II Corps {13}. Throughout August, and until the middle of September, the 3rd Light Pontoon Battalion supported various divisions of the II Corps in their repeated attempts to cross the Naktong-gang and breach the Pusan Perimeter. With its organic NLP light pontoons, the battalion constructed bridges, ferries and “underwater bridges” in the sectors of the 1st, 8th, 12th, 13th and 15th Infantry Divisions. A possible example of this was a NLP ferry encountered by UNC forces on the Naktong-gang at Songju.¹⁷ Another example may have occurred shortly after 10 August when the 48th and 50th Infantry Regiments of the 15th Infantry Division conducted an assault crossing of the Naktong-gang near the village of Indong, 30 km northwest of Taegu {14}. While the majority of the troops waded across the river (reported to be 1.2 m deep) the T-34 tanks attached from the 105th Tank Division and other heavy equipment forded the stream utilizing an “underwater bridge” constructed of sandbags piled to within a foot of surface.¹⁸

Following the successful 15 September UNC amphibious landing at Inch'on the 1st Engineer Regiment and its subordinate units were engaged in rearguard operations to provide time for the main KPA units to withdraw. The 2nd Heavy Pontoon Battalion conducted rearguard operations at crossing sites over the Naktong-gang until the main body of the I Corps had made good its withdrawal. During this rearguard action the battalion was annihilated. In a similar fashion, the 3rd Light Pontoon Battalion secured crossing sites along the north sector of the Pusan Perimeter to allow the withdrawal of I Corps units. It too was annihilated during these rearguard operations.

On 15 September the 1st Engineer Regiment headquarters and those elements of the 4th and 5th Battalions located in the Seoul area were organized for the defense of the city as they awaited the arrival of reinforcements (i.e., 1st and 9th Infantry Divisions and 17th Mechanized Division) from the I and II Corps. By 19 September the elements 1st Engineer Regiment in the Seoul area were assigned the defense of the railway and pontoon bridges over the Han-gang. They were assisted by troops from the 584th Railroad Engineer Regiment. In the ensuing fighting these units were dispersed and annihilated.¹⁹

Concurrent with the defensive operations in Seoul the advanced Engineer Bureau headquarters in Seoul withdrew to P'yongyang.

As UNC forces subsequently advanced on P'yongyang much of the Engineer Bureau withdrew north to Sinuiju and Manchuria along with the General Staff Department. The fate of the 1st Training Battalion located at Kan-ni is unknown. Elements may have been able to withdraw north with the Engineer Bureau towards Sinuiju or Kanggye.

Following the intervention of the Chinese Volunteer Army (CVA) in October 1950 the remnants of the KPA commenced a reorganization and re-equipment program, part of which was centered in the city of Kanggye in the remote northern central mountains of Korea {15}. During this process not only were engineering battalions reestablished at front and corps levels, but the Engineer Bureau reconstituted a training battalion and the 1st and 2nd Engineer Regiments to provide river crossing and specialized engineering capabilities to the reorganizing KPA.

While it is possible that some experienced personnel may have been involved in these reconstituted units the majority of the personnel appear to have been hastily conscripted recruits without prior military experience, or inexperienced students who had attended the Engineer School or the Military Academy at P'yongyang.

Little detailed information is available concerning the reconstituted 1st Engineer Regiment. It is known that possibly as early as December 1950 elements of the regiment were in the P'yongyang area. Fearing another amphibious assault the regiment's 3rd Battalion was assigned responsibility for

the defense of the Nampo-P'yongyang highway {16}. For this it established twelve evenly spaced and heavily mined platoon defensive positions along the length of the highway.²⁰ The regiment was subsequently transferred to the Wonsan area—possibly moving there during early 1951 {17}. Its mission in the P'yongyang area being taken over by the 2nd Engineer Regiment. During January 1951 the regiment may have received augmentation in the form of a battalion, or battalions, transferred from the 2nd Engineer Regiment (see below). In the Wonsan area the 1st Engineer Regiment was likely engaged anti-invasion preparations and in the repair and reconstruction of bridges along the east coast. By the end of the war the regiment had a strength of approximately 1,200 personnel and was organized into a regimental headquarters, support elements and three specialized engineer battalions—heavy pontoon, light pontoon and technical. *(Part 3, covering the 2nd Engineer Regiment will appear in the next issue)*

The KN-02 SRBM

By Joseph S. Bermudez Jr.

(The images that accompany this article were taken at the 2007 KPA military parade in P'yongyang.)

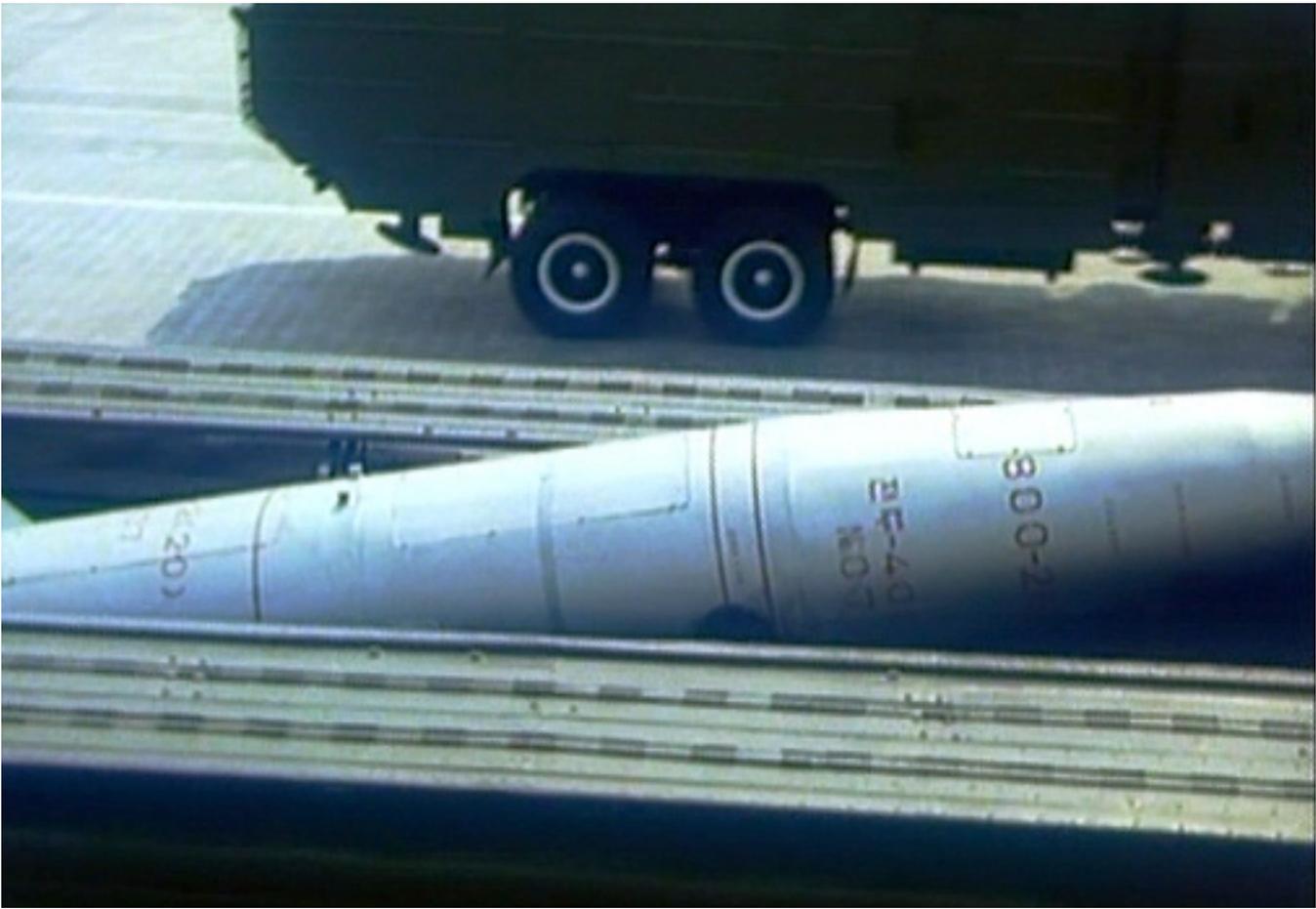
On 25 April the Democratic People's Republic of Korea (DPRK) conducted a military parade celebrating the 75th Anniversary of the founding of the Korean People's Army (KPA). Notable in the parade was the display of several current missile systems and their associated transporter-erector-launchers (TELs). Publicly exhibited for the first time was the KPA's version of the Soviet/Russian 9K79 Tochka (SS-21 Scarab), known outside the DPRK as the KN-02 (the KN-01 being a short range anti-ship cruise missile).

The most visible difference between the KN-02 system presented at the parade and the original SS-21 is the new TEL employed. The original system utilized the 9P129 6x6 wheeled TEL.

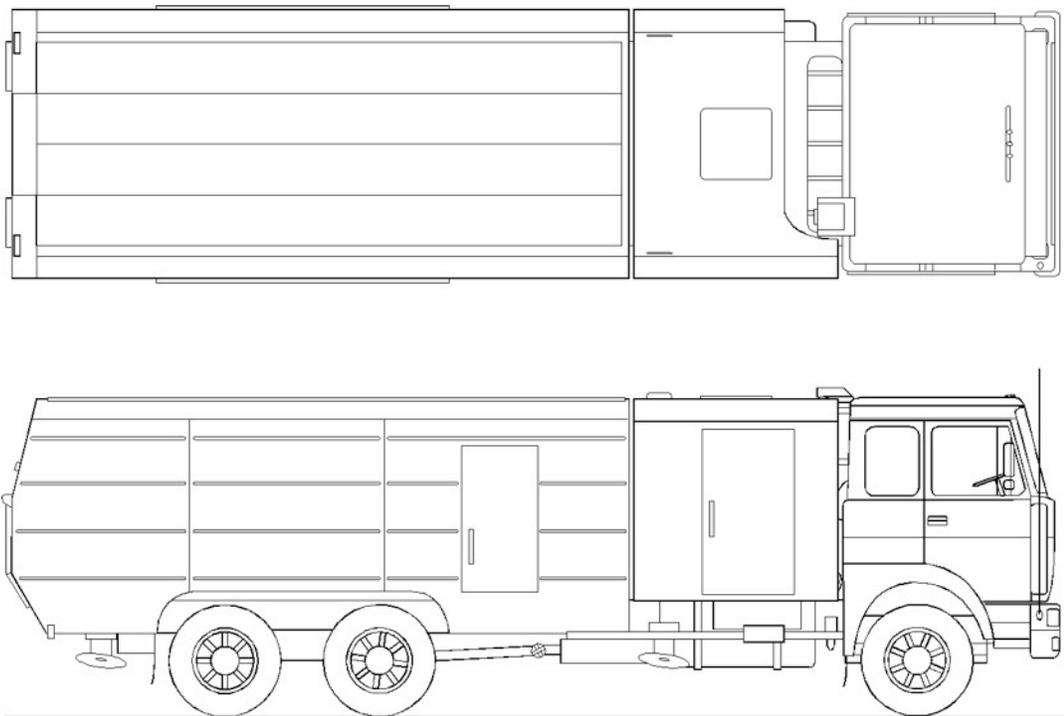
The KPA version consists of a locally fabricated TEL based upon an imported MAZ-630308-224 or -243 commercial 6x4 truck chassis. The DPRK has mounted a enclosed rectangular launcher bay on the rear chassis which protects the missile and launch rail during storage and transportation. When required for maintenance, or combat operations, two roof panels running the length of the launcher bay open allowing the missile to be raised and launched. The associated generator, test equipment, stabilizer jacks, etc. are in a separate cabinet located between the forward cab and launcher bay, and in cabinets along both sides of the launcher bay.

It is believed that the KPA has also developed a reload transporter capable of transporting 2-4 KN-02 missiles based upon the same MAZ chassis as the TEL.









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Provisional drawing of the KPA's KN-02 TEL (scale approximate).

While the missile itself was only partially exposed during the parade no details concerning possible differences from the original system could be determined.

Development

The organizations responsible for the development of the KN-02 and its related systems are believed to be the Korean Workers' Party Munitions Industry Department and its subordinate Second Economic Committee and the Second Academy of Defense Sciences (defense research and development). Within the Second Economic Committee the key organizations are likely to be the Second Machine Industry Bureau (development and production of the launcher and support vehicles) and the Fourth Machine Industry Bureau (development and production of the missile system itself).

It is believed the original source of SS-21 (9K79 Tochka) missiles for the KN-02 program were examples provided by Syria during the early 1990s (possibly 1994). At that time the DPRK had reached a point where it was interested in both replacing its aging inventory of 3R10 Luna-2 (FROG-5) and 9M21E Luna-M (FROG-7B) artillery rockets, and in developing a solid fuel tactical ballistic missile. This occurred simultaneously with an expanding Syria-DPRK missile relationship. The net result was that the DPRK was allowed extensive access to all of Syria's missile systems, missile technology and UAVs. Included within this were access to the

SS-21 Scarab, P-35 Redut (SSC-1b Sepal), P-20 Rubezh-A (SS-C-3 Styx) missiles; solid fuel rocket engine technology; and the DR-3 Reys UAV. Subsequently a small number of SS-21s and TELs (as well as other systems) were transferred to the DPRK and an exchange of missile related personnel commenced.

An early example of these exchanges occurred during mid 1996 when a number of Syrian technicians spent two weeks in the DPRK. This trip was reportedly concerned with both allowing the Syrians to study the production of the Scud C and sharing information concerning the SS-

21 which the Syrians had provided. Syria and the DPRK have since maintained a close relationship in the field of ballistic missile development and Syria now produces the DPRK's Scud C and D.

A number of important questions surround the KN-02 program:

First, is the KN-02 a range-enhanced variant of the standard SS-21 supplied by the Syrians, or is it based upon the newer Russian 9M79-1 Tochka-U (Scarab Mod 2)? At present it is unlikely that the Russians would have provided the Tochka-U, which is currently in service with its own armed forces, to the DPRK. It is more likely that the DPRK has based its KN-02 system upon the standard 9K79.

Next, is the KN-02 system actually produced in the DPRK, or have they simply acquired a number of former Soviet/Russian systems and modified them? While it is clear that the DPRK has both developed a new TEL and tested the KN-02 to a distance of 100-120 km, it is unknown what path they utilized to achieve these results. The DPRK has produced large caliber artillery rockets since the 1960s and has remanufactured or updated its existing inventory of FROG-7 since the 1970s. Additionally, some sources indicate that the DPRK has manufactured the FROG-7 system. Given this experience and its current technology base the DPRK undoubtedly possesses the indigenous capability to produce a

reversed engineered SS-21. Resources would, however, be constrained for certain engine and guidance system components due to international nonproliferation and counter proliferation efforts. If, on the other hand, the DPRK has obtained a significant stock of SS-21 missiles the most probable suppliers would include Syria, Yemen and possibly Iran—all of whom have purchased ballistic missiles or related technology from the DPRK. Additional SS-21 missiles or components may have also been obtained from several former Soviet republics or client states.

Finally, assuming that the DPRK KN-02 is based upon the standard SS-21, how has the range been increased to 100-120 km? The simplest means would have been to lighten the warhead and make compensating adjustments to the guidance and propulsion system. Alternately, the DPRK could have remanufactured the existing rocket motors and installed them in a standard SS-21 airframe (very unlikely). It is unclear which method they have pursued. In either case, valuable assistance may have come from Iran, Pakistan or China.

As with their FROG-7 artillery rockets and Scud ballistic missiles it is believed that the DPRK has developed a variety of warheads for the KN-02 including: unitary high-explosive, high-explosive fragmentation, cluster/bomblet, chemical and potentially a biological warhead.

Development and production details for the KN-02 are not available. The January 18th Machine Factory (a.k.a., No. 118 Factory) in Pyongyang, Pyongyang-si, which was previously reported to have been involved in the effort to produce reversed engineered version of the FROG-7, would appear to be a likely candidate for work on the KN-02.

Operational Aspects

It is estimated that the KPA's order-of-battle consists of 2-3 FROG-7/KN-02 brigades. During peacetime the Ballistic Missile Training Guidance Bureau is believed to exercise operational control over these assets as well as the KPA's other ballistic missile units. Wartime would probably see the FROG-7/KN-02 units placed under the operational control of Corps commanders.

A 120 km KN-02 provides some distinct logistical and operational benefits to the KPA. Being a solid fuel rocket it is easier to maintain, store and operate when compared to its liquid fuel counterparts. With proper inspection and maintenance, solid fuel systems may remain viable for 10-20 years. The KN-02 possesses a significantly shorter reaction and reload time than existing Scud missiles - providing increased wartime survivability. The 120 km range allows the KN-02 to strike targets significantly further south of Seoul than would existing 65-70 km ranged FROG-7 systems, while being positioned further north and out of range of ROK/US counter battery fire (with the notable exception of ATACMS). The 120 km range would also allow them to

strike at US installations which are currently being relocated further south, away from the DMZ. Finally, it is estimated that the CEP for the KN-02 is between 100-200 meters which is considerable better than the 500-700 meters of the FROG-7. This increased accuracy allows for the expenditure of fewer rounds to destroy a given target when compared to the FROG-7.

Foreign interests

The DPRK undoubtedly perceives the KN-02 system as a potential source for earning foreign currency. At the end of 2000, Saddam Hussein's Iraq signed contracts with the DPRK for at least \$9 million worth of military technology. Some of the contracts covered the DPRK's provision of guidance and control systems, inertial navigation systems, and on-board computers intended to improve the accuracy of short-range surface-to-surface missiles. Iraq also sought to purchase gyros and accelerometers and "...existing SS-21 Tochka components..." Iraqi missile personnel believed that these components would be useful in their Al Fat'h and Al Samud systems. The contracted components were to be delivered via Syrian ports within 9 months of contract initiation. The net results of these contracts and the delivery status of the equipment is unknown. No such DPRK provided equipment was located in Iraq by coalition forces following Operation Iraqi Freedom in 2003.

It is unclear if KN-02 technology or systems will flow back to Syria from the DPRK, or be provided to other interested nations such as Iran. It would appear that Syria would have both an interest and operational requirement for such a system.

Finally, the KN-02 may be attractive to a number of Third World nations such as Yemen or Myanmar who are interested in updating their armed forces, but are unwilling to incur international ire for the purchase of a 300-500 km Scud B or C class system.

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(This article is a revised version, including higher quality graphics, of one that appeared in 2007 as "North Korea Takes Wraps Off KN-02," Jane's Defence Weekly, May 9, 2007, jdw.janes.com.)

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- Yu, Yong-wo'n. “DPRK Disclosed Three Missile Types for 'First Time' at 25 April Parade,” *Chosun Ilbo*, April 28, 2007.

Editor's Note

I'd like to begin by offering an apology for the extended length of this month's issue. I, however, wanted to include both the entire 1st Engineer Regiment article and include a number of quality images of the KN-02 SRBM. In the future I will attempt to keep the issues shorter.

I'd also like to say “thank you” to all the readers of *KPA Journal*. The response to the inaugural issue was positive and overwhelming. In fact, it was far greater than I could have ever hoped for.

While I have a number of ideas of the direction I would like to take *KPA Journal*, I would greatly appreciate hearing from readers what you would like to see.

Now to respond to a number of common questions that I have received from readers.

- The www.kpajournal.com website is **not** yet up, but I am making slow progress on it. When it goes “live” I will let everyone know.
- *KPA Journal* is free. There are no costs for readers and I don't foresee there being any within the near future.
- I do not have a firm publication schedule for future issues of *KPA Journal*. At present, I foresee that the third and final installment of “KPA Engineer River Crossing Units” will appear in Issue 3 during March.
- A number of readers have shown a strong interest in the “underwater bridges” and bridging equipment employed by the KPA during the Korean War. I am in the process of preparing an article on these subjects and it could be ready for Issue 4.
- There is strong interest in KPA *Order-of-Battle* (OOB) and *Tables of Organization and Establishment* (TOE). This information is extremely difficult to come by at the open

source level. I will, however, endeavor to include as much of this information as possible when it is available.

- Other readers have asked for more information concerning seaborne infiltration operations. So I'm in the process of preparing an article tentatively entitled “DPRK Seaborne Infiltration Routes.” Which will describe the general routes utilized by Korean Worker's Party (KWP) and KPA Reconnaissance Bureau seaborne operations over the years.
- I would like to have articles on KPA tanks, self-propelled guns and other armored fighting vehicles as the journal moves forward. While I envision that these will be short I would like to include scale drawings. Such drawings, however, take a long time for me to produce. So this may be delayed.
- With regards to KPA ground force equipment there is strong interest in quality images and correct/current reporting names/designations. I have some images and hope to acquire more this year. If I can locate a current recognition guide (the ones I have are at least 15 years old) or listing of reporting names I will start including short photo essays on individual systems.
- There is obviously a significant interest in the DPRK's ballistic missile systems, and the research, development and production infrastructure. This issue's coverage of the KN-02 is a small step in beginning to address these subjects.
- As to my previous books on the KPA that are now out-of-print. I will begin the process of revising them this year, starting with *North Korean Special Forces*. How long this will take is presently unknown. It all depends upon my free time. I will likely self-publish the books as most publishers want to charge far too much for the books and I would like to keep the cost to the reader as low as practical.

As always readers are encouraged to share *KPA Journal* with friends and colleagues. If you have any questions, comments or criticisms please do not hesitate to contact me at kpajournal@gmail.com. I might be slow, but I will attempt to answer all correspondence.

—Joseph S. Bermudez, Jr

Endnotes

I would like to extend my sincere thanks to Stephan "Cookie" Sewell for providing a translations of major portions of N. L. Volkovskiy's book.

- 1 Interview data acquired by Joseph S. Bermudez Jr.; "Yu Song-chol's Testimony, Part 7," *Hanguk Ilbo*, 8 November 1990, p. 10; "Yu Song-chol's Testimony, Part 8," *Hanguk Ilbo*, 9 November 1990, p. 10; "Yu Song-chol's Testimony, Part 9," *Hanguk Ilbo*, 11 November 1990, p. 10, 23 November 1990; U.S. Army. *Research Supplement: Interrogation Reports*, GHQ, FEC, MIS, GS, ATIS, Issue No. 104, pp. 2-32 (hereafter: *ATIS IR 104*); and U.S. Army. *North Korean Engineers, Engineer Intelligence Study 323*, Chief of the Engineers, February 1962, p. 9 (hereafter: *NK Engineers*).
- 2 The unit is reported to have also been assigned a code designation of 2476.
- 3 A 1962 U.S. Army intelligence report describing KPA engineer assets during the war correctly identifies the 1st Engineer Regiment, "The Frontline Headquarters (now called Army Command) was organized in Seoul during the first week of July 1950, to coordinate all military operations south of the 38th Parallel. Its engineer section was very small and its limited facilities were supplemented by parts of the headquarters of the 1st Engineer Regiment. Most of the regiment's operational units, however, were sent down to the two corps subordinate to the Frontline Headquarters at that time, to provide additional specialized engineer support of a scope and nature which corps and division engineer battalions were not prepared to furnish." *NK Engineers*, p. 4-5.
- 4 Early U.S. Army intelligence reports suggest the possibility that the 934th Road Construction Battalion may have been part of the 1st Engineer Regiment since it was established at Kan-ni sometime in March 1949 and was directly subordinate to the Ministry of National Defense (MND). It was assigned the wartime mission of maintaining main supply routes in the immediate tactical rear of the advancing I and II Corps. It is unlikely that the 934th was a component of the 1st Engineer Regiment as postwar intelligence reports indicate the existence of the Military Roads Administration Bureau within the General Staff Department's Rear Services Bureau. While it is unclear when the Military Roads Administration Bureau was established it is most likely that the 934th was either the forerunner of this bureau, or subordinate to it. *ATIS IR 104*, pp. 2-32.
- 5 Initial reports suggested the possibility of a fifth company, however, this does not appear to be likely.
- 6 Chief Editor N. L. Volkovskiy, *The War in Korea 1950-1953*, Saint Petersburg, OOO Izdatel'stvo Poligon, 2000, pp. 574-575 [translations by Stephen "Cookie" Sewell].
- 7 U.S. Army. *Research Supplement: Interrogation Reports*, GHQ, FEC, MIS, GS, ATIS, Issue No. 100, 30 April 1951, pp. 32-33 (hereafter: *ATIS IR 100*); *ATIS IR 104*, pp. 22-23; and Volkovskiy, pp. 42-46.
- 8 Volkovskiy, pp. 574-575 and *ATIS IR 100*, pp. 32-33.
- 9 Ibid.
- 10 Ibid.
- 11 "Yu Song-chol's Testimony, Part 10," *Hanguk Ilbo*, 13 November 1990, p. 10.
- 12 Pak Kil-nam was commander of the Engineer Bureau throughout the war and remained in that position until at least 1962. At that time a U.S. Army Engineer Intelligence Study provided the following biography, "PAK Kil-nam, alias PAK Nicoli, Engineer Major General, has been chief of the NKA Engineers since 1950. Born in the U.S.S.R. about 1918, he received 11 years of formal education there. He graduated from a Soviet military academy, and is a member of both the Soviet Communist Party and the North Korean Labor Party. PAK is 6 feet tall, slim and mild-mannered; he is married to a Soviet-born Korean. He speaks Russian fluently, Korean poorly. His past career includes service as an engineer company commander with the rank of captain in the Soviet Army, during World War II; senior rifle instructor of a North Korean military school (1945); chief of the Engineer Section of the NKA Group Headquarters (1947); and chief of NKA GHQ Engineer Section (1950). He received the Highest Hero Medal for his part in the Han River crossing at the outbreak of the Korean War." *NK Engineers*, p. 31.
- 13 U.S. Army. *Research Supplement: Interrogation Reports*, GHQ, FEC, MIS, GS, ATIS, Issue No. 4, 15 December 1950, pp. 27-41 (hereafter: *ATIS IR 4*; Volkovskiy, pp. 42-46; and "Yu Song-chol's Testimony, Part 10," *Hanguk Ilbo*, 13 November 1990, p. 10.
- 14 U.S. Army. *Engineer Intelligence Notes*, No. 1-1952, Army Map Service, 22 January 1951, p. 1.
- 15 Ibid.
- 16 *ATIS IR 4*, pp. 98-100; and U.S. Army, *ADVATIS Interrogation Report*, #1155, GHQ, FEC, MIS, GS, ADVATIS, 15 October 1950.
- 17 U.S. Army. *Engineer Intelligence Notes*, No. 1-1952, Army Map Service, 22 January 1951, p. 3.
- 18 The 105th Tank Brigade was elevated to division size and awarded the honorific of "Seoul" for its role in capturing Seoul. The new "division," however, remained the size of a brigade until later in the war. U.S. Army. *Interrogation Reports, North Korean Forces*, GHQ, FEC, MIS, GS, ATIS, Issue No. 3, 15 November 1950, p. 42.
- 19 Volkovskiy, pp. 112-131.
- 20 Volkovskiy, pp. 616-618.