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STUDENT RESEARCH REPORT

MASKIROVKA:

THE SOVIET SYSTEM OF CAMOUFLAGE

1981

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GARMISCH, GERMANY

APO NEW YORK 09053

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER USARI-0251	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) MASKIROVKA: The Soviet System of Camouflage		5. TYPE OF REPORT & PERIOD COVERED
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) MAJ Kenneth C. Keating		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Russian Institute APO NY 09053		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Office of the Director of Instruction US Army Russian Institute		12. REPORT DATE June 1981
		13. NUMBER OF PAGES 24
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		

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MASKIROVKA: THE SOVIET SYSTEM OF CAMOUFLAGE

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June 1981

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FOR OPEN PUBLICATION

FEB 10 1982

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DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (DFOISR)
DEPARTMENT OF DEFENSE

U.S. ARMY RUSSIAN INSTITUTE

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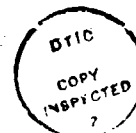
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SUMMARY

In this paper, the author discusses the Soviet system of camouflage measures. While the Russian word maskirovka, which is usually translated as camouflage, is used by the Soviets to describe these measures, much more is encompassed in what the author calls "the Soviet system of camouflage" than those measures normally associated with the term camouflage. Included are such things as skillful use of terrain, deception operations, smoke operations, and anti-radar camouflage. The author discusses these measures and also examines the technical means of camouflage, i.e. standard camouflage equipment, available to Soviet units. Finally, the author draws some conclusions as to the implications for the West of Soviet camouflage employment techniques.

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MASKIROVKA: THE SOVIET SYSTEM OF CAMOUFLAGE

Introduction

Throughout the history of warfare, various deceptive tactics have been used to convince the enemy that one's forces were larger than they actually were or that they were located in a different position than suspected. However, serious attention only began to be paid to camouflage in the First World War. By this time national armies had gotten away from wearing bright colored uniforms and carrying glittering weapons into battle. Technological progress was, of course, the motivating factor behind these changes; for as weaponry improved, stand-off distances increased, and cover and concealment could be used to one's advantage.

By the time of the Second World War, camouflage came to be an important weapon in the arsenal of national armed forces. The Red Army was quick to recognize the usefulness of camouflage and successfully employed this technique throughout World War II.

Sophisticated advances in the means of reconnaissance and observation such as overhead photography (both aerial and satellite), ground surveillance and counter-battery radars, infrared devices and passive night vision instruments have placed ever increasing demands on the use and importance of camouflage. The Soviet term maskirovka--usually translated as camouflage--represents a total system of measures designed to deceive and confuse the enemy, and reduce or eliminate the effectiveness of his means of reconnaissance and is a response to the challenge of technology.

A number of books and numerous articles have been written by Soviet authors concerning camouflage and its proper application. The most recent work was published in 1976 and represents an updating of older works. This paper will be a general synthesis of the available unclassified literature concerning the Soviet system of camouflage. Its purpose is to emphasize the importance the Soviets place on camouflage, the effectiveness of their camouflage applications, and the implications for United States military personnel who may gain first hand experience of such applications in a future conflict.

Lessons from Soviet Use of Maskirovka in World War II

As in almost all areas of current Soviet military training, considerable emphasis is placed on the successful employment of camouflage in the Great Patriotic War -- World War II. From both Soviet and German references to the Soviet use of camouflage during the war, it can be seen that the Soviet soldier had, and possibly still has, an advantage over his Western counterpart. Some observers have concluded that the Soviets possess an instinct for using camouflage to conceal themselves and their activities. For example, during World War II one German general observed that:

The Russian infantryman was a master in the fortification of field positions. It was astonishing to see how quickly he disappeared in the ground and camouflaged his location. Russian soldiers instinctively make use of the terrain so that they are hard to spot.

Another observer concluded that "the Russian has a useful instinct for camouflage, deception, and improvisation."² Further German observations continued:

The kinship with nature, which the Russians have retained to a greater degree than the other peoples of Europe, is also responsible for the ability of the Russian soldier to adapt himself to terrain features and actually to merge with them. He is a master of camouflage, entrenchment, and defense construction. With great speed he disappears into the earth, digging in with unfailing instinct so as to utilize the terrain to make his fortifications very difficult to discover. When the Russian has dug himself into the soil and has molded himself into the landscape, he is a doubly dangerous opponent.

While a concept such as national character is nebulous indeed, it cannot be discounted when evaluating an opponent. In this case, the Soviet natural instinct and affinity for the land as demonstrated during World War II, can aid in the employment of camouflage. That camouflage can enhance combat power cannot be disputed. Added to a military force that almost instinctively employs such techniques, camouflage becomes twice as effective.

In addition to the Soviet soldier's apparent instinct for applying camouflage, his strict training and the enforcement of camouflage discipline within the Soviet armed forces enhance the effectiveness of his camouflage techniques. The Soviet soldier is superior to Western soldiers in some respects and camouflage could possibly be one of those areas. While the U.S. Army also has a camouflage doctrine, it is not something that is always included in operational plans; nor is it one of the first considerations of the individual soldier in a field environment. Furthermore, while the U.S. uses camouflage netting and local vegetation to conceal troops and locations, the extensive and imaginative use of these materials is not on the same scale as that of the Soviet forces. Based on the emphasis given to camouflage techniques in Soviet military journals, there can be no doubt that the Soviet soldier will continuously and efficiently use camouflage procedures in a future conflict. Potential adversaries must be cognizant of that fact.

The Meaning of Maskirovka

In his book Taktika, Reznichenko states that the objective of camouflage "is to conceal from the enemy the true position of our troops and to give him a false idea of it and thereby to lead him into error and force him to a conclusion which does not correspond to the situation. Furthermore, camouflage constitutes the most important means of achieving surprise, which is one of the basic conditions for success in battle."⁴ Camouflage is defined as "a type of support for the combat operations and daily routine of the troops; a set of measures designed to mislead the enemy with respect to the presence and disposition of troops, various military installations, their status, combat readiness, and operations, as well as the plans of the command element."⁵ This set of measures, or system of camouflage, consists of such actions as concealing true targets and installing simulated ones; carrying out demonstrative actions; deliberately interfering with technical intelligence means; applying concealment properties of the terrain; periodically changing troop and command post locations; use of camouflage clothing, paint and nets; light and sound discipline; anti-radar concealment; and the use of disinformation.⁶

With regard to the level of employment of the various camouflage measures and the nature of the problems to be considered, the Soviets subdivide camouflage into strategic, operational, and tactical.⁷ Strategic camouflage "consists of measures for the covert preparation of a strategic operation or campaign, as well as disorientation of the enemy as to

the true purposes and actions of the Armed Forces."⁸ It is accomplished only by decision of the Supreme High Command.⁹

Operational camouflage is implemented by decision of the front or army commander and is directed at ensuring secrecy in preparing operations.¹⁰ "It is carried out with the purpose of disorienting the enemy as to the nature of impending combat operations, the intent of the operation, its scale, and the time of execution."¹¹

Tactical camouflage consists of those measures conducted by division or smaller size units in order to conceal preparation for, combat or the disposition of forces.¹² This paper will be limited to a discussion of operational and tactical camouflage.

Soviet Principles of Camouflage

To achieve the maximum effectiveness from their camouflage measures, the Soviets emphasize four basic camouflage principles: activity, conviction or plausibility, continuity and variety. By activity is meant the reliable implementation of the entire complex of measures aimed at deceiving the enemy with regards to the true disposition and intentions of one's own troops.¹³ For example, during World War II, a Soviet rifle company was given the mission of defending an important mountain pass. The company commander ordered the deployment and concealment of the attached antitank guns and mortars. He then ordered false positions prepared and concealed -- but not nearly as completely. Following a probing action by a German reconnaissance unit, the enemy launched a full scale attack on the defenders by a group of nine bombers. The bombers located and attacked the false positions leaving the real gun deployments untouched. The defenders were then able to repulse the ensuing ground attack of the

enemy with great success.¹⁴ Thus, the active nature of camouflage was able to convince the enemy of the presence of troops and weapons in places where they were not.

The plausibility or conviction of camouflage means that the measures taken appear convincing to the enemy, creating an impression of reality in scale, time, and place.¹⁵ In one instance during the Great Patriotic War, a rifle platoon secured a village and consolidated in it. The enemy had an observation point overlooking the village. The platoon commander sent small groups of soldiers away from the village and had them return by a conspicuous route. The enemy observers believed that a large number of troops were concentrated in the village. In the evening, the platoon attacked. The enemy, believing he was outnumbered, quickly withdrew with the loss of men as prisoners.¹⁶

Continuity of camouflage demands constant and timely execution of camouflage measures. Concealing materials must be constantly renewed and refreshed.¹⁷ "Attempts to use camouflage occasionally or to implement only certain elements of the complex [of camouflage measures] in an isolated manner will not lead to the desired results."¹⁸ Under present circumstances of advanced means of reconnaissance, there can be no respite from the application of camouflage means i.e. they must have continuity.

The final Soviet principle of camouflage is that of variety. Variety means the exclusion of a pattern in implementing camouflage measures, in the selection of techniques and means of camouflage. "Identical techniques of cover or in creating false objectives repeated several times will sooner or later be revealed and recognized by the

enemy."¹⁹ Variety, then, simply means avoiding repetition in the application of camouflage measures from operation to operation.

Applying the Principles

With these principles of camouflage in mind, the commander of each battalion, company, artillery battalion, and battery personally organizes the camouflage activities of his subordinate units. In doing so, he takes into consideration the forms and means of enemy reconnaissance, the revealing indicators of his type unit, the camouflage properties of the terrain, the weather condition, season, and time of day.²⁰

The first assets that the Soviet commander uses are the local conditions. He does not rely on sophisticated technical means of concealment but uses ingenuity and imagination to effectively employ local resources in the camouflage of his unit. Along with his natural instinct for the land, the Soviet soldier is trained in the skillful use of terrain. "Knowledge of the properties of terrain is required of soldiers and sergeants of all companies of the forces of the Soviet Army. In combat, you see, literally all the troops must use terrain to camouflage their actions, to build and fortify sheltered positions for people and supplies, for conducting firing conveniently."²¹ Soviet forces can be expected to use dense woods which contain concealing undergrowth for their defensive positions and assembly areas. This type environment allows for concealment from aerial, ground and radar observation. Population points are also favored camouflage locations and possess the additional advantage of giving protection from heat reconnaissance devices. The reverse slopes of hills can be used to provide protection from enemy ground observation.²² Concealing of troops that are being deployed for rest

in assembly and concentration areas will be achieved primarily through the skillful use of natural masking and cover.²³

In conjunction with the skillful use of terrain, it can be anticipated that Soviet forces will exploit periods of limited visibility i.e. darkness, fog, dense low cloud cover, and precipitation, when the efficiency of the enemy's means of reconnaissance is limited. The Soviets believe, however, that modern technology can still penetrate the limiting conditions with radar and infrared devices and stress that conditions of limited visibility must be supplemented by other camouflage techniques.²⁴

Camouflage discipline is strictly enforced and enhances the effectiveness of other camouflage measures. It consists of the special requirements of troop behavior necessary for a specific situation.²⁵

Depending on the character of the troop operations and the conditions of the situation, movement of personnel and vehicles in specified places may be limited or forbidden, and also the making of tracks on open sectors of terrain, the use of lanterns and lights without blackout devices, the firing of stoves and foraging for wood, and the operation of radio communications facilities to transmit. Specific rules are also established for conducting fire to preclude revealing its system prior to the beginning of battle, and also rules for the use of night vision devices and radar sets, the order of troop movement, the supplying of material, and the engineering equipping of positions and areas.²⁶

During World War II, the Russians enforced strict camouflage discipline -- "any man who left his shelter during the day was punished severely, if it was forbidden for reasons of camouflage."²⁷ There is no reason to believe that today's Soviet soldiers would not be similarly treated.

Technical Means of Camouflage

In addition to the use of local resources, Soviet units have a variety of technical means available to them to aid in fulfilling their camouflage responsibilities. Included among these means are camouflage

clothing, camouflage netting, and camouflage paint. Camouflage clothing generally consists of coveralls for the snow-less periods of the year and white camouflage suits intended for use against a background of snow. The coveralls can be used against a background of either green vegetation or sand.²⁸ Camouflage coveralls are worn by special troops such as snipers, field engineers, forward observers, signal, and reconnaissance troops. Other troops are expected to camouflage themselves with locally available vegetation.²⁹

The Soviets have a variety of standard issue camouflage sets available for unit use. The current model is designated as the MKT and is produced in three types: MKT-L for summer use; MKT-T which is transparent for use on a background of green vegetation; and the MKT-S for winter use. The main components of the MKT set are the frame and the cover or net. The cover is 12 meters by 18 meters and consists of 12 interchangeable elements. The various sets weigh between 40 and 70 kilograms and can be erected in 5-10 minutes during daylight hours and in a slightly longer period during the hours of darkness.³⁰

In addition to the MKT camouflage set, the Soviets also issue a multi-purpose frameless net which they call the "Shater." It consists of two camouflage covers each 12 meters by 18 meters in size, anchoring pegs, stakes, packing cases, etc.³¹ The "Shater" net is used to conceal large items of combat equipment. Standard screens and camouflage nets issued in earlier years are still available to troop units and supplement the MKT and "Shater" nets.³²

The covering material of the various camouflage sets is used to construct screen covers, horizontal, vertical and disruptive screens.

Screen covers are those which completely cover the item and touch the ground on all sides. They can be used to conceal sectors of trenches, vehicles, ravines, bridges, and so on. Vertical screens are erected to prevent ground observation while horizontal screens protect from aerial observation. Disruptive screening is used to break up the characteristic outlines of mobile objects such as tanks, trucks, and the like.³³

It is both interesting and important to note that the Soviets employ their camouflage nets in several unique ways. By constructing vertical screens parallel to lines of communication, they are able to restrict enemy observation of traffic moving along those routes. Further, they can be expected to employ over-the-road screens, i.e. screens which straddle the road at sufficient height to allow passage of traffic underneath and which thereby restrict overhead observation. Each of the standard issue camouflage sets is expected to be supplemented with locally available camouflage means such as trees, brush, fences and so forth.

As is the case with most modern armies, the Soviets use paint as a tool to aid in the camouflaging of material. Protective or dazzle painting is used for mobile objects while protective or simulating painting is used for stationary objects. Protective painting is of one solid color designed to make equipment less noticeable against a given background. Dazzle painting consists of differently shaped and colored spots which correspond to those found on the surrounding terrain and is designed to distort the external appearance of an object. Simulating painting is basically dazzle painting of immovable objects.³⁴

A rather interesting component of the Soviet maskirovka complex is that of anti-radar camouflaging. This type camouflage is achieved by the creation of false targets or by blending into the terrain background those objects one wishes to conceal. False targets are created through the use of corner reflectors.

...Corner reflectors were very extensively used in World War II and have not lost their importance in the present. Linear or area interference masks are usually made up of them, permitting reliable concealment of column movement over open terrain from radar observation. With the aid of corner reflectors, it is also possible to camouflage against observation such targets as bridges, dams and other road structures and, consequently, to prevent their destruction by a nuclear strike or by precision bombing by aircraft. It is also possible to create dummy targets quickly and with minimum expenditure of effort -- such targets³⁵ as bridges, moving columns, areas of troop locations, etc.

These reflectors are made from sheet metal and can be placed on poles, trees, or other local materials as well as on motorcycles or vehicles. They are generally commercially produced as the surface must be extremely flat to maximize its radar wave reflecting capability.³⁶

Other Components of Maskirovka

The camouflage techniques discussed to this point have all related to the concealment of troops and equipment. Concealment, however, is only one part of the Soviet system of camouflage. Also included in maskirovka is the use of feints which are the intentional display of troop units and equipment with the purpose of giving the enemy a false picture of the unit's true intentions.³⁷

Disinformation is another component of maskirovka and consists of the intentional dissemination of false information about one's forces, their composition, armament, fighting efficiency, combat operations plans, and so on in order to mislead the enemy and thereby create more favorable conditions for achieving success.³⁸

The final component of maskirovka is simulation which consists of reconstructing the telltale signs of troops and military installations by building dummy structures and employing mock-ups of armament, military equipment, smoke agents, electronic, and light and sound simulation.³⁹ The Soviets had extensive experience with such simulation during World War II and frequently recount their successes in contemporary articles. For example, in the fighting for Kursk, the combat engineers set up dummy artillery positions in one of the Soviet defensive sectors by using wheels from vehicles and painted logs. The simulated guns were placed in emplacements and from a distance looked like the real thing. When an enemy scout aircraft appeared, the engineers simulated firing from the artillery pieces through the use of pyrotechnics. Shortly, three flights of German bombers arrived to destroy the artillery position. Once they left, the engineers immediately set to work restoring the simulated guns. The scene was repeated six times over the course of the day causing the enemy to waste 117 bombs on this one dummy target.⁴⁰

The Soviets believe so strongly in the utility of simulated activity that they have dedicated resources to the construction of collapsible mock-ups of various pieces of equipment. These mock-ups are transported to the site where they are to be used in knock-down form. It is estimated that one truck can transport 7-10 mock-ups of tanks to the front.⁴¹ To be totally effective, dummy positions must simulate a real position in terms of size, number of pieces of equipment for the unit simulated, sound, light, activity of troops and so on. The Soviets frequently check on the effectiveness of their camouflage measures through observation, photography, radar, and aerial reconnaissance.⁴²

Concealment measures are accomplished by units of all branches of troops without special orders from the high command. Feints, simulation and disinformation, however, are carried out only by the direction of or with the permission of the senior commander.⁴³ This is necessary to ensure the proper coordination of such operations with other friendly forces.

Smoke Operations

One final aspect of Soviet camouflage needs to be examined and that is the Soviet use of smoke. Smoke can be used in support of both concealment and simulation activities. The Soviets identify three types of smoke application: concealing smoke, blinding smoke, and decoying smoke. Concealing smoke is used to hamper or preclude enemy observation of unit operations. Blinding smoke is deployed on enemy locations and obscures the firing and observation points of the enemy thereby denying him the capability of conducting observation over the battlefield. Decoying smoke is employed in areas not occupied by friendly troops with the purpose of deceiving the enemy with regard to the actual location, movement, and intentions of friendly forces.⁴⁴ An example from World War II will help to clarify the employment of each of these type smoke screens:

During the fall of 1943, Soviet troops encountered strong German defenses on the Sozh River south of Smolensk and were forced to halt their attack. The division commander decided to regroup his forces and attack under the cover of smoke. Using artillery and mortars, a blinding smoke screen was laid down on the bank occupied by the Germans. A camouflaging smoke screen was used to cover the two main routes for the troop movement to the edge of the water. Finally, a decoying smoke screen was

established at several fake sectors by means of smoke pots, including the use of floating pots on the river's surface. Smoke generation began at the dummy crossing sites along with the simulation of the sounds of troop movement to these sites. When the enemy opened fire, his defensive positions were revealed and fired upon by the Soviets. Subsequently, smoke generation began at the actual crossing sites and although the defenders fired on them, the density of fire was not high. Under cover of smoke, the Soviets were able to reach the river almost without losses, cross it, and break through the enemy defenses.⁴⁵

While the Soviets continue to emphasize the uses of smoke in situations like the one described above, they are also aware of its usefulness on the modern battlefield. Smoke can be used to reduce the level of thermal radiation resulting from nuclear detonations, to degrade the effectiveness of antitank guided missiles and laser guided munitions, and interfere with infrared, television, night vision, and radar reconnaissance instruments.⁴⁶

The Soviets possess a wide variety of smoke producing devices including hand and rifle grenades, pots, drums, barrels, generators, mines, aerial bombs, and mortar and artillery shells. Smoke can be delivered from both fixed and rotary wing aircraft.⁴⁷ Additionally, many Soviet armored vehicles have the capability of producing smoke by injecting raw fuel directly into the engine exhaust manifold, vaporizing it and forcing it through the exhaust outlet.⁴⁸

Conclusion

There can be no doubt that the Soviets are serious about camouflage. The wide variety of means included in their system of camouflage

encapsulated in the term maskirovka attests to that fact. Nevertheless, recent articles indicate that some officers do not believe that camouflage can achieve its stated goals.⁴⁹ They believe that the current range of modern reconnaissance means can penetrate any camouflage employment and therefore is not worth using manpower and material resources in its application.⁵⁰ Such officers are often criticized by their superiors and in the military press for their shortsightedness and in accordance with Soviet doctrine, camouflage means continue to be emphasized during training exercises.⁵¹

The Soviet soldier will be a formidable adversary in any future conflict. By the skillful implementation of the techniques of camouflage discussed here, his effectiveness can be increased. Soviet forces made wide use of camouflage during World War II and will undoubtedly do so in the future. Potential opponents must be aware of the kinds of activities the Soviets discuss in their literature and practice in their exercises so that they can both recognize and counter them. Hopefully, this brief discussion has aided in the achievement of that goal.

Footnotes

¹Major-General Hellmuth Dorn, "Engineer and Technical Services," in The Red Army, ed. B. H. Liddell Hart (Gloucester, Mass: Peter Smith, 1968), p. 374.

²Colonel Louis B. Ely, "The Officer Corps," in Ibid., p. 399.

³Department of the Army, Russian Combat Methods in World War II (Washington, D.C.: Government Printing Office, 1950), p. 6.

⁴General-Major V. G. Reznichenko, Taktika (Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1966), p. 148.

⁵Sovetskaya Voennoyaya Entsiklopediya, 1978 ed., s. v. "Maskirovka."

⁶Ibid.

⁷Ibid.

⁸V. A. Matsulenko, Operativnaya Maskirovka Voysk (Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1975), p. 1.

⁹Sovetskaya Voennoyaya Entsiklopediya, 1978 ed., s. v. "Maskirovka."

¹⁰Ibid.

¹¹Matsulenko, Operativnaya Maskirovka Voysk, p. 1.

¹²Ibid.

¹³Colonel V. Schedrov, "Camouflaging Troops During Regrouping and Maneuver," Voennoyaya Mysl 6 (June 1966): 61, in Foreign Press Digest, Foreign Broadcast Information Service.

¹⁴A. A. Beketov, A. P. Belekun, and S. G. Chermashentsev, Maskirovka Deystviy Podrazdeleniy Sukhoputnykh Voysk (Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1976), pp. 9-11.

¹⁵Shchedrov, "Camouflaging Troops," p. 61.

¹⁶Beketov, Maskirovka Deystviy, pp. 11-12.

¹⁷Ibid., p. 12.

¹⁸Colonel B. Mikhaylov, "Improvement of Systems for Protection of Troops from Weapons of Mass Destruction," Voennoyaya Mysl 7 (July 1967): 61, in Foreign Press Digest, Foreign Broadcast Information Service.

- ¹⁹ Beketov, Maskirovka Deystviy, p. 12.
- ²⁰ Ibid., p. 17.
- ²¹ Lieutenant Colonel K. Korolev, Learning to Use Terrain Skillfully (Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1955), p. 39, translated by U.S. Army Foreign Science and Technology Center.
- ²² Beketov, Maskirovka Deystviy, pp. 60-61.
- ²³ Shchedrov, "Camouflaging Troops," p. 67.
- ²⁴ Beketov, Maskirovka Deystviy, p. 61.
- ²⁵ Ibid., p. 16.
- ²⁶ Ibid.
- ²⁷ Department of the Army, Russian Combat Methods, p. 87.
- ²⁸ Lieutenant Colonel F. I. Myshak, Maskirovka Soldata, Oruzhiya, i Boyevoy Tekniki (Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1954), pp. 14-16.
- ²⁹ Ibid.
- ³⁰ Beketov, Maskirovka Deystviy, pp. 32-34.
- ³¹ Ibid., p. 35.
- ³² Ibid., p. 34.
- ³³ Ibid., pp. 64-75.
- ³⁴ Ibid., pp. 62-63.
- ³⁵ Shchedrov, "Camouflaging Troops," p. 65.
- ³⁶ Beketov, Maskirovka Deystviy, pp. 35-36.
- ³⁷ Colonel B. Varenyshev, "Sredstva Maskirovki," Voyennyye Znaniya 10 (October 1979): 29.
- ³⁸ Sovetskaya Voennoyaya Entsiklopediya, 1978 ed., s. v. "Maskirovka."
- ³⁹ Ibid.
- ⁴⁰ Lieutenant Colonel A. Gorkin, "Maskirovka Pozitsii," Voyenny Vestnik 4 (April 1977): 104-105.
- ⁴¹ Beketov, Maskirovka Deystviy, pp. 37-40.
- ⁴² Shchedrov, "Camouflaging Troops," p. 68.

- ⁴³ Sovetskaya Voyennaya Entsiklopediya, 1978 ed., s. v. "Maskirovka."
- ⁴⁴ Beketov, Maskirovka Deystviy, pp. 82-83.
- ⁴⁵ General-Major B. Abramtsev, "Dymovye Zavesy," Voyennyy Vestnik 7 (July 1978): 76.
- ⁴⁶ Defense Intelligence Agency, Soviet/Warsaw Pact Ground Force Camouflage and Concealment Techniques (Washington, D.C., January 1978), p. 24.
- ⁴⁷ Beketov, Maskirovka Deystviy, pp. 47-51.
- ⁴⁸ Defense Intelligence Agency, Soviet/Warsaw Pact, p. 25.
- ⁴⁹ Colonel Yu. Malisov, "Maskirovka -- Delo Vazhnoye," Voyennyy Vestnik 12 (December 1979): 77.
- ⁵⁰ General-Major A. Limno and Colonel A. Gorkin, "Effektivnost' Maskirovki," Voyennyy Vestnik 5 (May 1980): 83.
- ⁵¹ Ibid.

SELECTED BIBLIOGRAPHY

- Beketov, A. A., Belekun, A. P., and Chermashentsev, S. G. Maskirovka Deystiviy Podrazdeleniy Sukhoputnykh Voysk. (Camouflage Actions of Ground Force Sub-units.) Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1976.
- Defense Intelligence Agency. Soviet/Warsaw Pact Ground Force Camouflage and Concealment Techniques. Washington, D.C., January 1978.
- Department of the Army. Russian Combat Methods in World War II. Washington, D.C.: Government Printing Office, 1950.
- Dorn, Major-General Hellmuth. "Engineer and Technical Services." In The Red Army, pp. 367-375. Edited by B. H. Liddell-Hart. Gloucester, Mass.: Peter Smith, 1968.
- Ely, Colonel Louis B. "The Officer Corps." In The Red Army, pp. 395-402. Edited by B. H. Liddell-Hart. Gloucester, Mass.: Peter Smith, 1968.
- Gorkin, Lieutenant Colonel A. "Maskirovka Pozitsii." ("Position Camouflage") Voyennyy Vestnik 4 (April 1977): 104-107.
- Korolev, Lieutenant Colonel K. Learning to Use Terrain Skillfully. Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1955. Translated by U.S. Army Foreign Science and Technology Center.
- Limno, General-Major A. and Gor-in, Colonel A. "Effektivnost' Maskirovki." ("The Effectiveness of Camouflage.") Voyennyy Vestnik 5 (May 1980): 83-85.
- Malisov, Colonel Yu. "Maskirovka--Delo vazhnoye." ("Camouflage--Important Business.") Voyennyy Vestnik 12 (December 1979): 75-78.
- Matsulenko, V. A. Operativnaya Maskirovka Voysk. (Operational Camouflage of Troops.) Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1975.
- Mikhaylov, Colonel B. "Improvement of Systems for Protection of Troops from Weapons of Mass Destruction." Voyennaya Mysl 7 (July 1967): 55-64. In Foreign Press Digest, Foreign Broadcast Information Service.
- Myshak, Lieutenant Colonel F. I. Maskirovka Soldat, Oruzhiya, i Boyevoy Tekhniki. (Camouflage of Soldiers, Weapons, and Military Equipment) Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1954.

• Reznichenko, General-Major V. G. Taktika. (Tactics.) Moskva: Voennoye Izdatel'stvo Ministerstva Oborony, SSSR, 1966.

Shchedrov, Colonel V. "Camouflaging Troops During Regrouping and Maneuver." Voyennaya Mysl 6 (June 1966): 61-69. In Foreign Press Digest, Foreign Broadcast Information Service.

Sovetskaya Voyennaya Entsiklopediya. (Soviet Military Encyclopedia.) 1978 ed. S. v. "Maskirovka."

Varenyshev, Colonel B. "Sredstva Maskirovki." ("Means of Camouflage.") Voyennyye Znaniya 10 (October 1979): 27-31.