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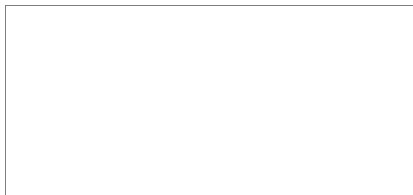
RESISTANCE FACTORS  
AND SPECIAL FORCES AREAS  
UKRAINE (U)



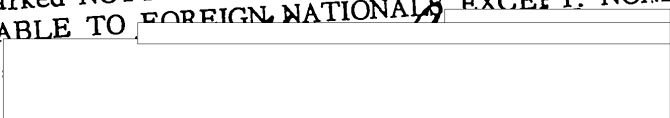
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## PART I

## RESISTANCE AND POPULATION FACTORS

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1. Introduction

The largest of the minority nationalities in the Soviet Union is the Ukrainian which occupies an important area of 232,600 square miles in the southwestern corner of European Russia, as well as smaller areas in southern Russia, Siberia, and Central Asia. The group totals 37 million people, or approximately 18 per cent of the population of the Soviet Union,\* and consequently rivals in numbers countries such as France, Italy, and West Germany. Its importance for the Soviet Union lies not only in its size, but also in the area it occupies which is one of the richest of the USSR both in agricultural and industrial production and in raw materials. As a result, the possibility of national resistance in the Ukraine has more serious implications for the Soviet Union than the possibility of resistance in other parts of the Soviet Union or in any of its satellites.

Of the factors which have influenced Ukrainians in their attitudes toward Russian rule and the Soviet regime, the long history of union between Russia and the Ukraine, extending from 1654 to the present in an almost unbroken line, ranks first in importance. During this span of more than 300 years Russian influence in the Ukraine penetrated deeply into the life of the country. Russian settlers moved into the eastern districts of the Ukraine and into its cities, and became the leaders in government, industry, and intellectual life. Many of the Ukrainians living in the cities as well as those drawn there from the countryside adopted Russian ways, gradually accepting Russian rule and abandoning their Ukrainian heritage. To a remarkable degree they identified themselves with Russians, and the urban areas of the Ukraine became Russian rather than Ukrainian centers. Only in the villages and agricultural districts was the Ukrainian language preserved and a feeling of distinctiveness from Great Russians kept alive. As a result, little open opposition to Russian authority developed, and the Ukrainian national movement remained unimportant.

\* Population figures used throughout the study are estimates for May 1, 1957, except where otherwise indicated.

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Gradually, however, Ukrainian nationalism was stimulated by an awareness of the differences of language, customs, etc. which separated the Ukrainian and Russian peoples, and especially by the feeling which became prevalent among many Ukrainians in the 19th and 20th centuries that Russian rule was synonymous with Tsarist oppression. The predominant position held by Russians in Ukrainian industry, commerce, and government and the corresponding discrimination against Ukrainians encouraged nationalists to oppose Russian rule and to re-emphasize the distinctive character of the Ukrainian people and their right to national autonomy or independence. It was this renewed interest in the Ukraine as a separate national region which led to the growth after 1850 of a Ukrainian nationalist literature and the beginnings of Ukrainian political organizations. By World War I the movement had grown to the point that organized resistance to Russian authority was possible, and during the civil war years from 1917 to 1921 Ukrainian nationalists organized a separate Ukrainian government and fought with some success against Russian forces.

In the period after World War I Soviet rule was established in the Ukraine and, in accordance with Bolshevik national policy, the Ukraine was recognized for the first time as a distinct unit separate from Russia with the right to use its own language and to develop its own cultural institutions. Under these conditions numerous Ukrainian nationalists were drawn to support the Soviet regime, and for a short time it appeared that the wave of anti-Russian feeling which had risen in the Ukraine might be absorbed and rendered harmless by the tolerant conditions of Soviet society. After 1927, however, Russian leaders embarked on an ambitious program calling for the collectivization of farms throughout the Soviet Union and a centralization of economic and governmental activities. Russian authority was consequently brought into direct conflict with the Ukrainian peasant, as well as with Ukrainian leaders who became increasingly aware of their secondary position within the Soviet Union. A new wave of Ukrainian opposition appeared, expressing itself first in open resistance to collectivization and secondly in the anti-Russian partisan move-

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ment which became a strong force in World War II. Although the resistance was directed against Soviet measures rather than against Russian rule, it assumed a strong nationalist form, demanding recognition of the right of the Ukraine to follow its own independent course. After World War II open resistance gradually disappeared, but Soviet sources as well as intelligence reports indicate that in many districts dissatisfaction with rule by Soviet Russia remains.

The great influence which Russians have exercised in the Ukraine over a long period of time and the relative similarity of the Ukrainian and Russian languages, customs, and backgrounds are distinguishing features which, in terms of resistance, set the Ukraine apart from the East European satellite countries. As a result, no resistance to Soviet rule on the scale to be found in the satellites is to be expected. Many influential positions in Ukrainian life are occupied by Russians or by Ukrainians sympathetic to Russian rule, and the points of conflict between Ukrainians and Russians are smaller than in other areas under Russian domination. Some Ukrainians are apparently only slightly aware of the differences which set them apart from Russians and feel little national antagonism. Nevertheless, important grievances exist, and among other Ukrainians there is opposition to Soviet authority which often has assumed a nationalist form. Under favorable conditions, these people might be expected to assist American Special Forces in fighting against the regime.

## 2. Traditional Resistance Background

### a. Separatist Traditions

Underlying Ukrainian opposition to Russian rule are a number of deep roots which have stimulated separatist feeling. The first and most tangible is the Ukrainian language which, though a division of the East Slavic language group, differs substantially from its allied tongues, Russian and Belorussian. Before the 19th century it was unwritten, and large segments of the Ukrainian intelligentsia and city population used

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it reluctantly if at all.<sup>1</sup> Nevertheless, it was the only language understood readily by the mass of the peasants, and after 1800 writings in Ukrainian began to appear despite the opposition of the Russian government.<sup>2</sup> By 1900 the language had developed a grammar, vocabulary, and structure of its own, and was officially recognized by the Russian Imperial Academy of Science.<sup>3</sup> The distinctiveness of the Ukrainian language has been important to the nationalist movement: the inability of the Ukrainian peasant to read Russian publications and to converse with Russians--particularly government officials--has contributed to his feeling of separation; and the struggle for an official recognition of the right to use the Ukrainian language has served as a nationalist rallying point.

A second basis for Ukrainian opposition to Russian rule grew out of the differences between Russian and Ukrainian customs and folk ways which set the Ukrainian people apart from the Great Russians. Their costumes were different as were their traditions and popular songs, their proverbs and folklore. As early as 1905 an English observer noted:

The city [Kiev] and the surrounding country are, in fact, Little Russian rather than Great Russian, and between these two sections of the population there are profound differences--differences of language, costume, traditions, popular songs, proverbs, folk-lore, domestic arrangements, mode of life, and Communal organization. . . . Indeed, if I did not fear to ruffle unnecessarily the patriotic susceptibilities of my Great Russian friends who have a pet theory on this subject, I should say that we have here two distinct nationalities, further apart from each other than the English and the Scotch.<sup>4</sup>

During the 19th century Ukrainian customs were abandoned by the upper classes--government officials, army officers, the nobility, and the higher clergy.<sup>5</sup> Many of the "Russified" families never regained a consciousness of their separate Ukrainian background. Yet the customs were preserved among the peasantry, and after 1880 were gradually extended upward again through the work of Ukrainian intellectuals.

The third root underlying Ukrainian separatism is the belief held by many Ukrainians that there was once an independent Ukrainian state which, however, became divided and enslaved by the Russians and Poles.<sup>6</sup> The state, it is

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argued, achieved its greatest glory under the Cossack leader, Bohdan Khmelnytsky, who ruled the Ukraine independently of Russia until 1654.<sup>7</sup> The subsequent subordination of the Ukraine to Russia was a clear violation, nationalists declare, of the area's historic right to independence--an independence that must be restored. This nationalist call for the re-establishment of an independent Ukrainian state has become one of the most forceful appeals of the separatist movement.

The fourth root of Ukrainian nationalism grew out of the sharp cleavage which existed between the eastern, industrial and urban, parts of the Ukraine and the western, rural districts. Traditionally the Ukrainian peasant has regarded merchants and city-dwellers with suspicion, blaming them for his low income and high prices. Inasmuch as the urban population has been predominantly Russian or Jewish,<sup>8</sup> the Ukrainian's dislike of the city has been transformed into a hostility for Russians or Jews. A Ukrainian writer expressed the sentiment as follows:

The city rules the village and the city is 'alien.' The city draws to itself almost all the wealth and gives the village almost nothing in return. The city extracts taxes which never return to the Ukrainian village. In the city one must pay bribes to be freed from scorn and red tape. In the city are warm fires, schools, theaters and music, plays. The city is expensively dressed, as for a holiday; it eats and drinks well; many people promenade. In the village there is nothing besides hard work, impenetrable darkness, and misery. The city is aristocratic, it is alien. It is not ours, not Ukrainian. It is Great Russian, Jewish, Polish, but not ours, not Ukrainian.<sup>9</sup>

After 1900 an agrarian movement developed in which the Ukrainian peasant identified his economic oppressors with his national enemies. Ukrainian nationalism was thereby reinforced by the demand for land reform and by the argument that Ukrainian peasants could obtain land and expropriate alien landlords and capitalists, if the Ukraine became an autonomous political unit.<sup>10</sup> The argument was equally effective under Tsarist rule with its semi-feudal system of land-holding and under Soviet rule with its collectivized and state farms.

Finally, Ukrainian nationalism developed out of the experience of

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Ukrainians living in the western districts of the Ukrainian SSR--in the districts incorporated into the Soviet Union during and after World War II.\*

Before World War I the most important of these areas--Galicia--was governed by the Austro-Hungarian Empire which adopted a relatively moderate policy toward its Ukrainian minority and permitted the development of Ukrainian political parties and the use of the Ukrainian language.<sup>11</sup> After World War I the area was incorporated chiefly into Poland and, although a less sympathetic policy was followed, Ukrainian political consciousness continued to grow, and political groups, particularly anti-Russian groups, to flourish.<sup>12</sup> By 1939, when the area was acquired by the Soviet Union, its Ukrainian population had become the most active politically of Ukrainian groups and the most firmly anti-Russian in its attitudes. Both during and after World War II this western group provided the most intense and resolute opposition to the Soviet regime.

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\* See Map A.



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## b. Resistance and Civil War, 1917-1921

The first strong indication of unrest in the Ukraine and of opposition to Russian rule came in World War I after the revolution of March 1917 had destroyed the Tsarist government and opened the way for local uprisings throughout the Russian Empire. Almost at once a group of Ukrainian intellectuals and students meeting in Kiev formed a Ukrainian council--The Central Rada--which was gradually broadened in membership until it became a sort of regional government for the Ukraine.<sup>13</sup> Although it refused to declare its independence of Russia, it displayed its national coloring by demanding regional autonomy, the right to use the Ukrainian language in the schools, and in government and public life, and the formation of separate Ukrainian military units.<sup>14</sup> The government was not widely supported by the mass of Ukrainians outside of Kiev, but it controlled a number of military regiments, and with the consent of the Provisional Government, jointly administered the Ukraine under a rather loose, temporary arrangement.<sup>15</sup> The Rada failed, however, to extend its influence below a relatively thin layer of intellectuals and nationalists, and when Russian Bolsheviks overthrew the Provisional Government and sent troops into the Ukraine, the Rada was quickly defeated and forced, early in 1918, to flee from Kiev.

Happily for the Ukrainian nationalists, the German government favored Ukrainian independence from Bolshevik control, and, adopting the Central Rada as its puppet, cleared the Ukraine of Russian troops and returned the Rada to Kiev.<sup>16</sup> Ukrainian nationalists consequently were given once again the opportunity to govern the Ukraine. Their freedom of action was limited by the German occupation and by the tendency of German officials to interfere both in the political life of the country and in its economic affairs, but much work was done in stimulating the growth of Ukrainian national consciousness. The Ukraine was recognized as an independent country by both Germany and Russia, and many Ukrainian peasants who had previously disliked aspects of Russian rule but had seen no other alternative began now under

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the influence of the Ukrainian flag and the Ukrainian language to accept the possibility of Ukrainian independence.

As a result, when the German occupation and its puppet regime collapsed late in 1918, a new Ukrainian government, the Directory, was formed, and for a time established in the capital city, Kiev.<sup>17</sup> More than any previous government the Directory was supported by Ukrainian peasants. It was defended by small military units and by peasant bands which were intensely nationalist and in some cases large and well-organized. At times it claimed the support of a broad section of the Ukrainian people, and the movement it guided grew in certain districts into a mass national uprising. At other times, however, the Directory was almost alone, as its supporting forces deserted to the enemy or returned to their homes or engaged in independent, petty raids. In any case the Directory was opposed by powerful armies it could not cope with, including Denikin's "White" troops, Polish and Rumanian forces, and the Bolshevik Red Army. By November 1920 it was finally defeated and forced into exile. Russian Bolshevik troops again occupied the Ukraine and again established a Soviet government there.

During the same years in which Ukrainian nationalists were working unsuccessfully to win control of the Ukraine, Ukrainian Bolsheviks also were failing to form a stable government. The first Ukrainian Soviet government was established in December 1917 in the eastern part of the Ukraine at Kharkov. It received only modest support in the Ukraine, but was aided by Russian Bolshevik troops and managed to occupy the area until forced out by the Germans.<sup>18</sup> It remained in exile in Russia until the end of 1918 when Germany's collapse enabled it once again to enter the Ukraine. With Russian help it seized much of the area and began to govern it in a centralizing way, refusing to recognize the Ukrainian language or the importance of Ukrainian nationalism.<sup>19</sup> It antagonized peasants and nationalists and lost all local support except in the eastern, Russian districts. By the end of 1919 it had again lost control, and was severely criticized by Russian Bolsheviks for its failure to accommo-

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date to local Ukrainian sentiment.<sup>20</sup> When it was re-established in the Ukraine, again with Russian help, it was ordered to adopt a more flexible policy, to encourage Ukrainian nationalists, and to accept the use of the Ukrainian language.<sup>21</sup>

The period of civil war in the Ukraine demonstrated that Ukrainian nationalism had become an important force in certain districts and that there was much opposition to Russian and Bolshevik rule. The opposition centered in the western and central parts of the Ukraine, while in the eastern, industrial districts, loyalty to Russia and to the new Soviet government remained uppermost. The opposition was poorly organized and was weakened because its greatest strength lay in the countryside where peasants were generally indifferent to politics and where equipment and supplies were not available to match the resources of the city. In addition, the opposition could command support only from the small parts of the Ukraine it held, while its enemies--the Bolsheviks, Poles, and forces of Denikin--could draw assistance from Russia, Poland, and other states. Nevertheless there was considerable sympathy within the Ukraine for its nationalist leaders, and the period has subsequently been glorified as a time in which the Ukrainian people struggled against numerous enemies in the face of overwhelming odds for their independence.

#### c. Resistance to Soviet Rule, 1921-1941

With the establishment of a stable Soviet government in the Ukraine in November 1920, resistance by nationalist bands quickly disappeared. The last partisan raid took place in October 1921 when a band of a few hundred men headed by General Tiutiunnyk was defeated after driving some distance into the western Ukraine from the Polish border.<sup>22</sup> Subsequently, resistance disappeared except for minor, local incidents.

Throughout the twenties little national opposition to Soviet rule was expressed. Russian Bolshevik leaders, anxious to win support in the Ukraine, adopted a surprisingly moderate policy, insisting that the Ukrainian language and culture be fostered, that native Ukrainians be drawn

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into leadership posts, and that local independence in economic affairs be granted.<sup>23</sup> As a result, Ukrainians lost much of their basis for opposition to Russian rule, and many nationalist leaders, non-Communists as well as Communists, took posts in government and public organizations and gave their support to the new regime.<sup>24</sup>

Gradually, however, conflicts developed between Ukrainian nationalists and Soviet leaders. The earliest appeared in cultural fields where a group of Ukrainians including members of the Communist Party began to demand that the Ukraine turn away from Russia in its literature and art, and toward Western Europe.<sup>25</sup> The leader of the group was a Bolshevik, Mykola Khvylovyi, and the group included the Ukrainian Commissar of Education, Oleksandr Shums'kyi. Under pressure from Stalin<sup>26</sup> and other Russian leaders the group finally withdrew from its demands, and no open conflict resulted. Nevertheless, many Ukrainian writers continued to oppose closer ties between Russian and Ukrainian literature, and the restrictions imposed by Bolshevik officials served to increase Ukrainian dissatisfaction with Soviet rule.

In 1927 new limitations on Ukrainian national development were adopted. In an April resolution of the Ukrainian Communist Party it was emphasized that the policy of fostering Ukrainian national institutions had led to a disregard of the rights of the non-Ukrainian minorities and to the development of restrictions on the right to use languages other than Ukrainian.<sup>27</sup> It ordered that minority languages be granted an equal status with Ukrainian, and that Russian specifically be established as a second language in the schools. The campaign was pushed further in 1929 when a subversive organization, the League for the Liberation of the Ukraine, was uncovered and accused of "pushing its own people into social, economic and cultural life, into the Party, into the Komsomol, and into the schools in order to utilize them for grafting nationalist ideas."<sup>28</sup> Over forty-five Ukrainian scholars including members of the Ukrainian Academy of Science were tried and convicted and exiled or sentenced to long prison terms. In 1931 and 1933, two additional organizations, the

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Ukrainian National Center and the Ukrainian Military Organization, were uncovered and additional arrests made. In all the organizations members of the Communist Party were discovered, some of them holders of important leadership posts. As a result, a complete Party purge was ordered for 1933. Over a fifth of the members of the Ukrainian Communist Party were expelled, the top leadership was replaced, and nearly a third of the regional (oblast) secretaries were removed. In addition, most of the officials of the Commissariat of Education and many university professors lost their posts.<sup>29</sup>

An even more serious opposition to Soviet rule appeared among Ukrainian peasants, who were brought after 1927 under steadily increasing pressure to surrender their land and join the new collective and state farms. In 1928, discriminatory taxes and forced grain levies were imposed on the wealthy peasants, restrictions were placed on individual peasant households, and measures were adopted for the encouragement of state and collective farms. In 1929, it was decided to eliminate the kulaks (the wealthy peasants) completely as a class: their land was made subject to confiscation; they were denied the right to join collective or state farms; and the government was empowered to deport them from their districts.<sup>30</sup> After 1930, most vigorous efforts were made to force all peasants to leave their individual farms. Peasants throughout the Soviet Union disliked the new measures, and the period from 1929 to 1933 was a period of sharp conflict in all agricultural regions.

In the Ukraine the greatest peasant resistance to the new farm policy was encountered--not at first because of any national hostility, but because the Ukrainian peasant was more seriously affected by collectivization than the Russian. Ukrainian peasants included traditionally a higher percentage of kulaks and middle peasants, for the milder climate and richer soil of the Ukraine made possible a higher farm income. Since the farm changes were directed primarily at the wealthier peasants, a larger percentage of Ukrainians were harshly affected. Secondly, the traditions of the Ukrainian peasant made it more difficult for him to accept the communalism of the collective

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farm: he had traditionally glorified the Cossack for his freedom and independence; he had idealized the institution of private, individual homesteads, with land passed from father to son; he had not become accustomed, as had the Russian peasant, to the system of "repartition" in which the village community periodically redistributed the land among the peasant families.<sup>31</sup> As a result, he found it even more difficult than did the Russian peasant to adjust to the new farm system with its restrictions on private ownership of land and on individual farm management.

Ukrainian opposition to collectivization was largely unorganized. Groups of peasants occasionally combined to resist grain collection forcibly; small bands of peasants raided collection points and wealthy farmers alike; but there was no large-scale, coordinated opposition. The resistance was important, however, because it involved many more Ukrainians than any previous uprising or nationalist movement. Few Ukrainian landowners did not make some attempt to retain their farms, or to hide grain or cattle from the collection team, or to resist deportation; and almost every Ukrainian was harshly affected by the famine of 1932-1933.<sup>32</sup> As a result, the severity of Bolshevik farm policy left a sharp impression on a wide section of the Ukrainian people, and that impression formed a basis for hostility to the regime.

The opposition to collectivization never became a large-scale national uprising. Ukrainian national sentiment existed, and Bolshevik leaders exaggerated its danger, claiming at one point that nine out of ten instances of "counter-revolutionary" activity were carried out under nationalist slogans.<sup>33</sup> The predominant element, however, was economic, and the Ukrainian peasant who attacked the grain collector did so to protect his property, not to uphold Ukrainian autonomy or independence. Yet the struggle did assume an ethnic character when Soviet leaders discovered they were forced to rely largely on urban dwellers and on loyal Communists imported into the Ukraine from Russian cities to enforce the new policy. Over 15,000 such workers were sent to the rural areas of the Ukraine.<sup>34</sup> Since they were almost without exception Rus-

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sians or Jews, a measure of national hostility appeared, and the basis was laid for a distinctly Ukrainian national rebellion directed against economic and social oppression by alien rulers. Such a rebellion did not materialize because of the Ukrainian peasant's lack of political consciousness and because the potential leaders of such a movement--the intellectuals and the nationalists within the Communist Party--had been removed by 1933 from influential positions. Yet the harshness of collectivization left the Ukrainian peasant with feelings of bitterness and opposition, and the heavy restrictions on private farms aroused his antagonism. His hostility was apparently directed chiefly against Bolshevik policy; but to a limited but increasing degree he identified the Russians with Bolshevism and with city oppression, and thereby became susceptible to anti-Russian, Ukrainian nationalist and separatist views.

#### d. Resistance During World War II\*

The outbreak of World War II and the subsequent invasion of the USSR by Germany provided Ukrainian nationalists with a new opportunity to oppose Soviet Russian rule. As the Red Army was forced back out of the Ukraine, Soviet controls were removed, and the Ukrainians were enabled, within the framework of German policy, to express their national feelings. At the same time the occupation permitted German observers to assess the strength and extent of Ukrainian nationalism. As a result, the wartime period with its lessons about resistance provided a number of concrete indications of the possibilities for conducting Special Forces operations in the Ukraine.

Ukrainian resistance during the war period was influenced by two factors. The first was the attitude of German authorities toward the Ukraine and specifically toward Ukrainian nationalism. On the whole, the German government, in keeping with Hitler's policy of maintaining absolute control over the conquered territories, gave only limited encouragement and support

\* See also Part II, Section 2 and Part III, Section 3.

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to Ukrainian nationalists. Before the outbreak of the war the Germans had encouraged Ukrainian emigre groups,<sup>35</sup> and the German Army had recruited Ukrainian translators and police units, and had organized a small Ukrainian military force; but among the highest German circles there was much opposition to Ukrainian nationalism, and following the invasion of the USSR many Ukrainian leaders were imprisoned and a stern policy adopted toward the national movement. Although the Army in its eagerness to develop Ukrainian military support continued to tolerate Ukrainian nationalists, allowing them to carry on political activities in occupied areas and to hold administrative posts in local government, German policy in general was one of restricting national enthusiasm.

The second factor influencing Ukrainian resistance was the important role played by Ukrainian emigres and by Ukrainians in the western, formerly Polish districts. Among these groups there had developed a number of political organizations which were extremely nationalist and anti-Soviet in their views and looked toward Germany for assistance in their fight against the Soviet Union. The chief emigre group was the Organization of Ukrainian Nationalists (OUN) which consisted principally of Ukrainians who had fled from the USSR following World War I and was now directed by a western Ukrainian, Andrew Mel'nyk. Following the German invasion of Poland in 1939 the OUN had been given administrative posts in the General government and had developed some anti-Soviet enthusiasm in the areas outside the Soviet Union. The group was weakened by the fact that its supporters were primarily emigres who had left the Ukraine after World War I and hence were conservative and without connections with Ukrainian nationalists inside the Soviet Union. Furthermore, the OUN had aroused some hostility by its willingness to cooperate with the Germans. As a result, on February 10, 1940, a splinter group headed by Stephan Bandera broke with the parent body and established a separate organization which was also called the Organization of Ukrainian Nationalists (OUN-B) and which quickly became as important as the first. Its membership was considerably younger than

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the Melnyk group (OUN-M) and it adopted a more radical position. It insisted on the most active, forceful measures for the establishment of an independent Ukrainian state, and it viewed cooperation with Germany with some misgivings. It was in a stronger position than the OUN-M, for many of its members had left the Soviet Ukraine only after Russian occupation of Eastern Galicia and hence had close connections with nationalists in the newly-acquired areas. Rivalry between the two occasionally became intense, and throughout the war period the organizations refused to coordinate their nationalist activities.<sup>36</sup>

As soon as German forces invaded the Soviet Union, the emigre nationalists attempted to spread their influence into Soviet Ukraine. In the western zones, especially in the areas acquired by the Soviet Union in 1939, hostility to the Russians was more intense and better organized than in the eastern sections. Underground uprisings were ordered, and at Sambor and in several regions of Eastern Galicia (Podhaisi and Monastiriska) Ukrainian militia took over police functions and dissolved the collective farms before the arrival of German troops.<sup>37</sup> On June 30, 1941, with the German occupation of L'vov, a group of Bandera supporters, with the tacit consent of the German Army, proclaimed the "re-establishment" of the Ukrainian state.<sup>38</sup> At the same time, both the OUN-B and the OUN-M dispatched "task forces" into the East Ukraine to establish nationalist cells in the principal cities, to proclaim the independence of the Ukraine, to organize an administrative service, and to build a Ukrainian army from former soldiers of the Soviet Red Army. The groups were tiny and ill-equipped and were successful only in forming small organizations in Zhitomir, Vinnitsa, Dnepropetrovsk, and Kiev.<sup>39</sup> Meanwhile, the Melnyk organization, by providing translators and advisors for the German Army, had been permitted to move with it through the Ukraine. On September 19, 1941, the group reached Kiev, where it established the administrative apparatus for the city.

The ability of the emigre nationalists to develop their authority in the eastern parts of the Ukraine was dependent on German military success in the Ukraine and on the willingness of the Germans to tolerate their ac-

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tivities. In contrast to the situation in the west Ukraine, there was in the east no organized nationalist underground, and the emigre leaders had few contacts on which to build such a movement.<sup>40</sup> Almost immediately after the German invasion of the Soviet Union, it was made clear that the Germans did not intend to support the activities of the emigre nationalists inside the Ukraine. Three days after the L'vov proclamation of an independent Ukrainian state, SS forces arrived in the city, dissolved the embryo government, and arrested Bandera and his supporters, sending them to Berlin. The OUN-B "task forces" were disrupted and adherents of Bandera in Zhitomir and the western Ukraine were executed or forced underground.<sup>41</sup> Supporters of Melnyk, more acceptable to the Germans, were given a longer period of relative freedom, but they too, after November 1941, were met by increasing restrictions. Some of their leaders were shot. Others were forced underground. In December 1941 authority over the Right Bank of the Ukraine was transferred from the German Army to the Reichskommissariat Ukraine. Under the harsh rule of Erich Koch the role of the emigre groups diminished until only the lower level posts in local government were left in their hands.

In addition to the work carried on by Ukrainian emigres, underground and partisan activity developed among groups living inside the Ukraine at the time of the German invasion. The largest groups appeared near Nikopol', in the Dnieper River bend, and in the Poles'ye swamps in the northwestern Ukraine.<sup>42</sup> Early in the war, when Ukrainian nationalists still hoped for German cooperation, the bands consisted primarily of Communists afraid of the harsh treatment they might receive at German hands, and of Red Army soldiers who had been separated from their units and who were fearful of German prison camps. By spring 1942, all the largest bands had been destroyed except one in the sheltered forest belt of Poles'ye northeast of Chernigov. This group, headed by Sidor Kovpak, was dominated by Communists, and most of its military supplies were provided by the Russian Army by air. Nevertheless it claimed to be a Ukrainian liberation movement; it published a Ukrainian language

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newspaper; and it received some support and food supplies from the non-Communist population. In late October 1942, Kovpak embarked upon a considerable raid throughout the northwestern quarter of the Ukraine. Crossing the Dnieper River he moved westward into Galicia, then south to the Carpathian Mountains, and then back again to the northern swamps.\* Apparently he received little support in the Carpathian Mountains where the population was strongly nationalist. Throughout most of his raid, however, he was hampered only slightly by the Ukrainian population or by Ukrainian partisan bands. At the end of the raid the group dwindled away except for a small troop in the forest regions.<sup>43</sup>

The second of the partisan bands was anti-Communist and distinctly Ukrainian. It was organized by Taras Borovets (Taras Bulba) who, with the initial permission of German Army officials, gathered together a group of several thousand Ukrainian partisans and stragglers from the Soviet Red Army. Its center of operations was the triangle-shaped area from Pinsk to Olevsk to Mozyr'. Until the end of 1941 it acted principally against Red partisan bands; but in November, when the Germans ordered the group disbanded, it withdrew into the woods and carried on activities against Germans and Communists alike. In July 1942 emissaries of the Soviet government requested it to join with the Kovpak band in its action against the Germans, but the demand was rejected.<sup>44</sup>

The third partisan band, also established in Poles'ye, consisted almost exclusively of Ukrainian nationalists. It appeared in the fall of 1942 when the Germans by their repressive measures had made plain their hostility to the Ukrainian national movement. It drew its support from Ukrainians fearful of the Germans and particularly from remnants of the Bandera group which had been dispersed by the Germans. From October 1942 until February 1944 it carried on open activities against the occupation. Its strength lay in its isolated location in the forest area north and

\* See Map M.

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west of Rovno, and in its proximity to Galicia where it could easily draw support from the emigre groups. Toward the end of 1942, the group adopted the title Ukrainian Insurgent Army (UPA), and in the next year forced the Borovets partisans and a number of Melnyk supporters to join with it. It grew in size as repressive German measures affected more and more Ukrainians until it controlled a large part of Volynia southwest of Rovno and the square from Kovel' to Vladimirets to Kostopol' to Lutsk. The group remained in control of the area until the Soviet advance in February 1944 forced it underground.<sup>45</sup>

Several conclusions may be drawn from the experience of Ukrainian partisans in World War II. First, it is significant that the only partisan movements of any size east of the Dnieper River were pro-Russian. Apparently whatever Ukrainian nationalist sentiment existed in the eastern Ukraine was unorganized and passive, and was unable, without external stimulus, to grow into an active force. Secondly, it is important to note that the pro-Russian Kovpak band which was partially dependent on local support was able to conduct a successful raid through the center of nationalist activity in northwestern Ukraine. It is true that the band was forced to detour to avoid the headquarters of the Bandera partisans, and apparently it was greeted with some hostility in the Carpathian area. Nevertheless, the Ukrainian partisans did not challenge it nor did the population oppose it as resolutely as they did the Germans. Perhaps its use of the Ukrainian language concealed its pro-Russian bias, or perhaps anti-German feeling had grown so strong that any group opposing the occupation was supported. Thirdly, it is noteworthy that the partisan bands developed their greatest strength as a reaction to the harsh German occupation and not primarily in opposition to the Soviet Union. Because of the speed of the German invasion it is perhaps natural that anti-Russian bands did not have an opportunity to organize themselves. At the same time there is no question that the Borovets and Bandera groups were consistently anti-Communist as well as anti-German. In general, however,

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greatest support for the nationalist partisans came from Ukrainians harmed by the German occupation, and the principal activities of the bands were directed against the Germans.

### 3. Resistance Activity, 1945-1957\*

#### a. Participants in Resistance Activities

With the re-occupation of the Ukraine by Russian troops at the close of World War II, the nationalist partisans who during the war had fought both against the German Army and against Soviet forces were incorporated within the Soviet Union. Many of the partisans were unwilling to accept Soviet rule and consequently did not return to their homes, but remained in the sheltered areas they had controlled during the German occupation and continued to oppose Russian forces. At the same time, as the Red Army again marched into the former Polish districts of Volynia and Galicia and as the Soviet government made clear its intention to incorporate these areas into the Soviet Union, large numbers of the inhabitants, disturbed by the prospect of Russian rule, began to support the partisans actively, providing them with food and supplies and offering them shelter. As a result, a solid base for opposition to the Soviet Union was established. An active resistance movement appeared, centered primarily in the Ukraine's western, newly acquired districts, and dominated by Ukrainian nationalists. It is this movement which has been responsible for most post-war resistance activity. Resistance in other parts of the Ukraine has appeared only sporadically and in a limited way, and apart from the nationalists, only small and unimportant bands or individuals have been involved.

#### (1) Ukrainian Nationalist Resistance Groups:

The opposition movement established by Ukrainian nationalist resistance groups has been marked as a highly organized, centrally directed movement, motivated by long-range objectives which have been outlined carefully. The movement has established as its primary aim the defeat of the

\* See also Part II, Section 3.

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Soviet forces controlling the Ukraine and the formation of an independent Ukrainian state. The movement has included in its activities not only open measures against the regime, such as the destruction of bridges and the burning of police headquarters, but also a program of economic and social resistance and an educational campaign of nationalist and anti-Bolshevik propaganda.

Three organizations have composed the resistance movement: the Organization of Ukrainian Nationalists (OUN); the Ukrainian Insurgent Army (UPA); and the Ukrainian Supreme Council of Liberation (UHVR). The three groups have been closely associated with one another and in fact their leadership has taken the form of an interlocking directorate with the same individuals occupying the top posts in each organization. For example, until his death in 1950 Roman Shukevich (General Taras Chuprinka) was the top leader of each of the three bodies: head of the Organization of Ukrainian Nationalists; commander-in-chief of the Ukrainian Insurgent Army; chief of the General Secretariat of the Ukrainian Supreme Council of Liberation.<sup>46</sup> Similarly, Petro Poltava (pseud.), who was until his death in 1952 the leading ideologist of the Organization of Ukrainian Nationalists inside the Ukraine, was also a major in the Insurgent Army and chief of its propaganda division, as well as deputy chief of the General Secretariat of the Ukrainian Supreme Council of Liberation.<sup>47</sup> The three organizations have been merely separate divisions of the underground movement: the Ukrainian Supreme Council of Liberation has been visualized as the official government of the Ukrainian underground; the Organization of Ukrainian Nationalists has been the political group dominating the underground movement; and the Ukrainian Insurgent Army has been the military force responsible for active measures of resistance. In recent years the distinctions between them have become of small importance except in emigrant circles, as Soviet counter-measures have almost completely destroyed the movement inside the Ukraine, transforming the three bodies into paper organizations.

(a) The Organization of Ukrainian Nationalists--This is the oldest and most firmly established of the three nationalist units. Its

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membership has consisted since World War II almost exclusively of western Ukrainians and particularly of Ukrainians from the areas ceded to the Soviet Union by Poland. The organization is directed by a Provid or Executive Committee whose members are apparently self-perpetuating and self-selecting. The last Congress of the Organization (the third Extraordinary Great Congress) was held in 1943 inside the Ukraine, and that Congress selected a bureau of three men to serve as the guiding body of the Executive Committee. The three men were Stephan Bandera, former chairman of the Executive Committee; Roman Shukevich, commander of the Ukrainian Insurgent Army and long-time associate of Stephan Bandera; and Yaroslav Stetsko, founder in 1940 together with Bandera of the radical wing of the Organization of Ukrainian Nationalists.<sup>48</sup> In 1950 Shukevich was killed by Soviet forces, and his place taken by Yuri Lemish (Colonel Vasil Koval).<sup>49</sup> In November 1952, Stephan Bandera, who had been living outside the Ukraine after 1941, resigned from the Executive Bureau with the explanation that only Ukrainians living inside the Ukraine should direct the work of the Organization.<sup>50</sup> Undisputed leadership of the Organization inside the Ukraine then was centered in the hands of Yuri Lemish, who remained as head of the Organization at least until March 1954.

The Organization of Ukrainian Nationalists has emphasized three points which explain its importance as the most active resistance group inside the Ukraine. First, it has adopted an extreme nationalist position, glorifying the nation as an independent entity in terms reminiscent of German National Socialism. The nation is regarded as "the highest and strongest type of organic human community," and as a "natural and eternal phenomenon in humanity."<sup>51</sup> In particular, the Organization has adopted as its motto the phrase, "The good of the Ukrainian nation is our supreme goal"; and the phrase has been interpreted to require the unconditional independence of the Ukraine.<sup>52</sup> The Organization has consequently become the most uncompromising of the Ukrainian groups in its demand for Ukrainian independence, and the most active in its opposition to Russian Soviet rule.

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Secondly, the Organization has insisted that Ukrainian independence can be achieved solely through revolutionary methods, and that consequently the Organization must remain an illegal, revolutionary group. Attempts to compromise with Russian leaders and to accept a gradual evolution of Ukrainian autonomy have been denounced, and Ukrainians who have cooperated with the Soviet government have been attacked as traitors to the Ukrainian nation. Only a militant and uncompromising battle waged by insurrectionary forces can, it has been argued, produce Ukrainian independence.<sup>53</sup>

Finally, the Organization has taken the position that only resistance groups actually operating inside the Ukraine can further the Ukraine's national aims. Although the Organization maintains an emigre division and although it seeks support from countries hostile to the Soviet Union, emphasis has been placed most strongly on the internal resistance movement.<sup>54</sup> In the years immediately following World War II, Organization leaders, in keeping with their policy of internal resistance, committed their partisan units to open battle with the Soviet Army. The policy was almost ruinous, and nearly half the bands were destroyed. After 1946 the Organization gradually shifted to a program of occasional partisan raids and general underground activities. It has retained, however, its emphasis on the importance of active resistance groups operating inside the Ukraine rather than abroad among emigre groups.

The Organization of Ukrainian Nationalists has been an important resistance factor in the Ukraine because it has been an extreme nationalist group insisting it will not compromise with the Soviet government until Ukrainian independence is achieved, because it has called for active opposition rather than passive submission, and because it has been the only political group maintaining underground forces inside the Ukraine. However, there have been important limitations on its effectiveness. Since it was organized initially by western Ukrainians living in Galicia, and since it has been dominated by western Ukrainians, the Organization has had few ties in the eastern Ukraine, and some of its representatives have been received by the population there with apathy or even hostility. In addition, because of its extreme philoso-

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phy, other Ukrainian groups in the emigration have refused to cooperate with it. Their supporters inside the Ukraine would probably oppose any resistance movement dominated by the Organization of Ukrainian Nationalists. Finally, it seems likely that most Ukrainians are unwilling to take as radical a stand as that adopted by the Organization, or to adopt its extreme nationalist views. Hence, more moderate Ukrainian groups might find it easier to develop wide mass support.

(b) The Ukrainian Insurgent Army--The military arm of the Ukrainian underground movement has been the Ukrainian Insurgent Army. The Army was formed initially during World War II from the merging of a number of partisan bands which had been operating in the western areas of the Ukraine against both the German occupation forces and also against pro-Soviet partisan bands. During the early years of the war the most important of the Ukrainian partisan bands were controlled by Ukrainian groups hostile to Stephan Bandera and his Organization of Ukrainian Nationalists. However, in 1943 the Bandera organization began to expand its area of control in the Ukraine, until by force or persuasion it had absorbed under its authority virtually all the anti-Russian partisans. The name, Ukrainian Insurgent Army, was adopted and a Bandera supporter, Roman Shukevich, was appointed head of the Army under the pseudonym General Taras Chuprinka. By the end of 1943 a central headquarters for the underground partisans had been set up, and the Army had established itself as a para-military armed force with regular formations operating in some areas and with a carefully defined organization.<sup>55</sup> Throughout 1944 and the first part of 1945 the Insurgent Army continued to grow in importance: it operated openly against Soviet forces; it made no attempt to conceal its major centers; it controlled important areas of the Western Ukraine. However, in the spring of 1945 the Soviet Army inaugurated a major military offensive against the insurgents, and by the end of 1945 most units of the Insurgent Army had been defeated and perhaps fifty per cent of its troops captured. The remainder of the Army broke up into small units which operated only in inaccessible forested areas, or went completely underground

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and ceased all open activities against the Soviet regime.<sup>56</sup>

After 1950 the Insurgent Army apparently disappeared as an effective and active organization. Although Colonel Koval was appointed to replace General Chuprinka as commander-in-chief, it appears that his command was only a nominal one and that there were few units coming even indirectly under his control. Until 1954 reports continued to indicate that he was in the Ukraine and still nominally Army chief, but the reports have said nothing about the scope of his authority. After 1954 even indirect references to Colonel Koval disappeared, and it seems likely that the organization is no longer of importance. There are perhaps a few isolated bands which remain in bunkers in remote forested regions, and their numbers may be replenished occasionally by a small stream of Ukrainians avoiding military service or fearful of Soviet reprisals for actions they have taken against the regime. Also there are undoubtedly many western Ukrainians who remain sympathetic to the Insurgent Army and who now and then render support. Perhaps leaders of the Insurgent Army retain some contacts with resistance groups and continue to prepare propaganda materials. In general, however, the Army has virtually disappeared, and it would seem unlikely that it could increase its activities under present conditions without outside assistance.

(c) The Ukrainian Supreme Council of Liberation--The impetus for the formation of the Ukrainian Supreme Council of Liberation came in the late fall of 1943 when the Bandera nationalists fighting inside the Ukraine decided that the nationalist movement would be strengthened by the establishment of a semi-governmental body which could easily be broadened into a full-fledged government in case Ukrainian independence were achieved. In addition, the Bandera group was anxious to have under its control a political body which could match the numerous exile governments and "Ukrainian National Councils" which other Ukrainian groups had formed.<sup>57</sup> In November 1943 an Initiating Commission was established and during the following seven months the Commission negotiated with various Ukrainian groups in an effort to build broad support

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for the new Ukrainian "government." The attempt was not completely successful, for the Hetmanite and Melnyk groups refused to cooperate. Nonetheless, a Congress of Ukrainian representatives was called to meet in the Carpathian area of the Ukraine in July 1944, and when twenty delegates arrived, the Congress declared itself to be a Constituent Assembly. On July 12 a constitution for the Ukrainian Supreme Council of Liberation was adopted and its principal officers chosen.<sup>58</sup>

The Supreme Council of Liberation was intended to serve as an underground parliament and government of the Ukraine, and to work for the establishment of an independent Ukrainian state. In theory its principal organ was to be a Grand Assembly, but the Assembly has not met since its 1944 session. Its only important body has been a General Secretariat or Cabinet headed by its Chairman, Yuri Lemish. In order to maintain contacts with Ukrainian emigre groups and to develop support abroad, the Supreme Council has maintained a foreign mission, the Foreign Representation, which has established offices in Munich.

In recent years the Foreign Representation has remained as the only active part of the Ukrainian Supreme Council of Liberation. The Council itself was never more than an adjunct to the other nationalist organizations in the Ukraine, and after 1950 it became almost completely inactive. It has played an important role in the resistance movement, however, in two respects. First, it has devoted much of its energy to the preparation and distribution of propaganda materials explaining the purposes of the nationalist movement and the aims of its leaders. It has thereby provided a more general framework for the nationalists and has helped to give their resistance activities a more organized form than that of simple bandit operations. Secondly, by maintaining contact with its emigre division it has provided connections between the resistance groups at home and nationalists abroad. Since the Supreme Council has been supported by a wider group of Ukrainians than has the Organization of Ukrainian Nationalists,

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its contacts with emigres have given the resistance movement a broader basis of support.

(2) The "Black Cat" Organization:

Apart from the Ukrainian nationalist organizations the only active resistance group in the Ukraine has been the "Black Cat" movement. It has never been of any great importance and there have been no indications of any activity by the group since the end of 1950. As far as is known, there has been no central organization for the movement, and it has been accused of being merely a number of separate bands which have adopted the name as a matter of convenience.<sup>59</sup> The group has been active throughout the Soviet Union, and incidents have been reported in Siberia, Smolensk, and especially in Minsk and other parts of Belorussia. Inside the Ukraine incidents have been reported only in Kiev and Odessa. The movement has been distinguished from the Ukrainian nationalist groups because it has been most active in the cities rather than in the rural and isolated areas. Undoubtedly some of its activities have been mere bandit operations of no political consequence. However, some reports have indicated that it has been distinctly anti-Communist and that one of its missions has been the assassination of Communist Party leaders.<sup>60</sup>

b. Characteristics of Resistance Activities in the Ukraine

(1) Types of Resistance Activities:

Resistance activities in the Ukraine during the period from 1945 to 1956 are described in Appendix I. Altogether there are listed in the table 231 incidents varying in intensity from the distribution of anti-Soviet pamphlets to actual armed engagements between as many as several hundred Soviet and Ukrainian troops. The incidents fall into three general categories (see Table I): (1) acts of opposition to specific Soviet measures of control and regulation; (2) acts of resistance which do not involve violence, but which are directed against the Soviet regime as a whole rather than against a single, specific Soviet decree; and (3) violent measures of resistance to Soviet rule. The first category includes all types of opposition directed not generally against the regime but specifically against a single measure

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such as collectivization, work-norms and food-delivery quotas, deportation, or military service. In some cases resistance incidents in this category do not indicate general hostility to the regime, but reflect merely the strong opposition of the Ukrainian peasant to a specific measure of collectivization or military service. A Ukrainian who generally supports Soviet rule may feel that his grain-delivery quota has been set too high, and may consequently try to avoid meeting the assigned figure. Such opposition does not indicate general resistance. In other cases, however, the opposition is an expression of an underlying, general hostility and may then be classified as a resistance activity. The incidents listed in Appendix I are considered to be of this type.

The second category of resistance activities includes incidents directed clearly against the regime as a whole, but not involving violence. Three types of incidents are included: (1) carrying on propaganda activities against the regime by distributing anti-regime pamphlets and leaflets, flying Ukrainian nationalist flags, and painting anti-Soviet slogans; (2) assisting insurgents or partisans by providing them with supplies, or by concealing them, or by giving them information about Soviet police; and (3) constructing underground bunkers. Although these activities have been directed against Soviet rule, they represent underground rather than partisan resistance.

The third category of activities includes incidents in which violent opposition to the regime is expressed. Four types of incidents are included: (1) plundering stores and supply depots; (2) destroying railroad installations, kolkhoz property, or government buildings; (3) assassinating supporters of the regime such as Communist Party members, leaders of local government, or kolkhoz chairmen; and (4) attacking Soviet police, security forces, or units of the Red Army. All four types of incidents represent the most active and forceful measures of resistance. The incidents have been carried out openly, and the resistance groups responsible for them have depended either upon their superior strength in a region which could easily be defended or upon

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the proximity of forested areas in which underground shelters could be built to escape destruction by Soviet forces. In the years immediately following World War II the resistance groups were strong enough to defend themselves openly in some areas against the Soviet army and MVD troops. After 1948 they were no longer able to do so and were forced to rely on shelter provided by the local inhabitants or on bunkers built in the remote forested areas. The individuals who have participated in the incidents have committed themselves irrevocably to opposition to the regime. They would undoubtedly provide active assistance for Special Forces, if modest guarantees against immediate reprisals could be provided.

As indicated in Table I, the most important single form of resistance in the Ukraine has been armed attack by insurgent groups against Soviet military forces (column 10). More than a quarter of the resistance activities listed have involved such open fighting. Almost all the encounters have been fought by units of the Ukrainian Insurgent Army, and the number of attacks has decreased as the size and importance of the Army has declined. In the years immediately following World War II as many as several hundred men were involved in each operation, and the Ukrainian units in some cases deliberately attacked Soviet military groups. After 1948 the number of participants fell to less than ten or fifteen men, and most encounters were fought to defend the insurgents against Soviet troops sent to destroy them rather than to achieve any particular objective.

The second important form of resistance has been the destruction by partisans of specific military or economic targets (column 8). Nearly a fifth of the incidents listed in Table I are included in this category. In the early period--from 1945 to 1948--military targets such as MVD headquarters and important railroad installations were most often attacked. Subsequently the targets most often destroyed were economic or political targets such as kolkhoz buildings and installations, or government offices and meeting halls of local Soviets. The shift in targets indicates the general shift in the

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TABLE I  
TYPES OF RESISTANCE ACTIVITIES IN THE USSR -- 1945-1956

Opposition to Soviet Control and Regulation			Non-Violent Resistance			Violent Resistance			
1 Opposing Collectiv- ization	2 Refusing to Meet Work Norms or Food- Delivery Quotas	3 Resisting Deportation & Evading Military Service	4 Assisting Insurgents (Providing Food or Shelter)	5 Distributing Pamphlets & Anti-Regime Slogans	6 Building Underground Bunkers	7 Plundering Stores & Supply Depots	8 Attacking Communications Lines & Farm & Government Property	9 Assassin- ating Sup- porters of the Regime	10 Attacking Soviet Military Forces
7 8 22 49 88 119 137 151 155	7 8 9 114 81 87	3 8 80 87 126	3 7 8 9 13 21 41 45 49 55 58 80 118 126 136 139 148 155	3 8 9 10 11 12 12 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000	1 60 61 89 93 91 125 125 110 125 125 159 160 1				

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resistance movement from a movement which was primarily military before 1948 to a movement which was chiefly economic and political. Most recently, the targets have been transportation and communications lines, probably because the lines are relatively poorly guarded as they pass through remote areas most suitable for partisan activities.

The third important category of resistance has been propaganda activities (column 5), including the printing or distribution of anti-Soviet pamphlets or the display in some form of anti-regime sentiments. Ukrainian nationalist holidays have been celebrated and nationalist songs sung; the graves of insurgents killed by Soviet forces have been decorated and Ukrainian flags flown openly; slogans attacking the regime have been posted. Unlike other forms of resistance, nationalist propaganda increased steadily after World War II, becoming most important in 1949 and 1950. Ukrainian nationalist groups deliberately shifted their emphasis from open resistance to propaganda work after 1948. After 1950 the number of incidents in this category decreased sharply as did all other forms of resistance in the Ukraine. However, some propaganda work continued though on a small scale, and apparently most resistance after 1953 was in this category.

The fourth important form of resistance has been the assassination of supporters of the regime (column 9). The targets most frequently chosen have been agents employed by the MVD as informers to observe the movements of the insurgents or their suspected sympathizers and to report to the security police. In some cases MVD leaders themselves have been ambushed and shot or killed in raids carried out against MVD headquarters. Leaders of collective farms have also been attacked when considered too conscientious in their management of the farms or too eager to deliver food-quotas. Other targets have been collaborators in the church, police, or government, or occasionally leaders of the army.

Other forms of resistance activity have been reported only on a smaller scale. Their importance, however, should not be minimized for in some cases they indicate an underlying hostility of the population to Soviet rule which

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is more significant than the number of reported incidents would suggest. Open opposition to collectivization, for example, accounts for only a small part of the resistance activities listed in Table I (column 1). However, there is much evidence to indicate that in the areas where such opposition has been noted the population has been almost completely hostile to collectivization although the hostility may not have been openly expressed. Special Forces units, by supporting a return to a system of independent farm holdings, could expect a measure of support from many of these people.

#### (2) Variations in Resistance Activities by Years:

Resistance activities in the Ukraine in the period after World War II developed in three different phases. In the immediate post-war period--1945 to 1947--resistance activities were carried out on a large scale following the pattern of opposition developed by Ukrainian nationalists during the war. Armed military units including as many as several hundred men were active in the Carpathian Mountains region and in the northwestern Ukraine, and parts of these areas were controlled by the insurgents. The opposition was carried out openly, and a number of large-scale battles were fought between insurgents and Soviet troops.

The second phase of resistance--1948 to 1951--developed on a much smaller scale. The largest resistance bands numbered less than fifty men and were no longer able to maintain control over any areas of the Ukraine. Most of the bands were nomadic--wandering from one remote wooded region to another and devoting most of their energy to obtaining supplies and avoiding Soviet forces. The bands continued to carry out raids on Soviet installations, but activity was much reduced; large parts of the year were spent in hiding in underground bunkers. Emphasis in the resistance movement was shifted from open measures against the regime to underground organization and propaganda activities.

The third phase of resistance--1952 to 1956--saw the elimination of almost all resistance groups. In the early part of the period reports indicated that active partisan bands were still to be found near Chernovtsy,

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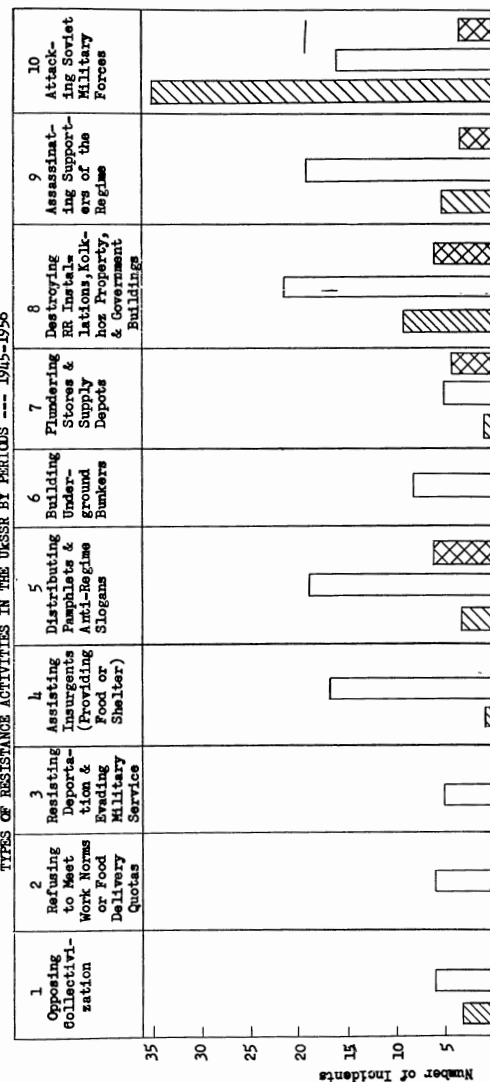
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Uzhgorod, Kadiyevka, and near other towns, especially in the Carpathian Mountains and in Poles'ye. The bands were apparently small--consisting of less than a dozen men--and carried out few raids, occupying themselves chiefly with avoiding Soviet forces. By the end of the period reports indicated that resistance was further diminished, being limited almost exclusively to propaganda work and underground activities. That a few partisan bands remained, however, was suggested by reports in 1956 and 1957 that trains crossing the Carpathian Mountains were still subject to attack, and that on occasion--most notably during the Hungarian uprising--railroad bridges were destroyed and trains derailed.

Table II compares the types of resistance activities which took place in the Ukraine after World War II in each of the three periods--1945 to 1947, 1948 to 1951, and 1952 to 1956. The most striking change indicated by the table is the steady decrease in the number of open attacks by insurgent groups against Soviet military forces (column 10). In the first period, thirty-five such attacks were reported; in the second, the number was cut approximately in half; in the third, only three open attacks were reported. The drop in the number of incidents reflects the change in the character of the Ukrainian resistance movement. In the years immediately after World War II the movement attempted to maintain its character as a military force by retaining under a regular military organization the partisan units which had developed during the war. During 1945 and 1946 and into 1947 the military units carried on organized operations in which as many as several hundred men were involved. However, in 1945 and 1946 the Soviet Army conducted a major campaign against the insurgents, and in 1947 the MVD security police continued the drive.<sup>61</sup> As a result, the insurgents were forced to limit their activity. During 1948 and 1949 the size of the partisan bands fell to less than twenty to thirty men, and apart from defensive action only occasional raids were carried out to impress the local population.<sup>62</sup> In December 1949, the Soviet government proclaimed an amnesty for all insur-

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TABLE II  
TYPES OF RESISTANCE ACTIVITIES IN THE UKSR BY PERIODS --- 1945-194733  
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gents who left their units,<sup>63</sup> and in the spring of 1950 MVD security police carried out a further intensive campaign against the bands. By 1952 open military activities were no longer feasible for the partisans.

In the other types of resistance indicated in Table II the pattern was somewhat different. The number of activities reported in the immediate post-war period was small; it grew rapidly in the years from 1948 to 1951; it fell back again sharply after 1952. These changes can best be explained by the fact that in the period immediately after the war Ukrainians who were resolutely opposed to Soviet rule were active in insurgent military units and did not take part in milder forms of resistance. Also, since the inhabitants of the western Ukraine had not yet been confronted seriously with the hardships of collectivization and work-norms, many accepted Soviet rule with little opposition. After 1948, however, most of the active resistance groups were forced to resort to more indirect and sheltered work such as assassinations and propaganda; the increasing severity of collectivization and deportations led many of those who had previously accepted the Soviet regime to oppose the new, objectionable measures. Consequently, the number of resistance incidents reported in the period from 1948 to 1951 increased. After 1952, however, the number of incidents dropped again as the same Soviet measures which had virtually eliminated open insurgent attacks also limited the possibility of other forms of resistance. In the period from 1952 to 1956 only those most bitterly hostile to the regime were willing to continue their opposition.

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## PART II

## GEOGRAPHIC FACTORS AFFECTING RESISTANCE AND SPECIAL FORCES OPERATIONS

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A. General Summary<sup>1</sup>

1. Introduction

The Ukrainian SSR occupies 222,600 square miles in the southwesternmost corner of the USSR. It extends approximately 850 miles from west to east and 550 miles from north to south, including the Crimea. In the west and southwest, where the Republic borders on the four satellite states of Poland, Czechoslovakia, Hungary, and Rumania, significant territorial gains were realized at the expense of these states as a result of World War II. The Moldavian SSR, in the southwest, represents a lengthy interposition between the Ukraine and much of the Rumanian frontier. The Belorussian SSR defines about half of the northern limits of the Ukraine; the remaining portion and all of the east is enclosed by the RSFSR. A limited section of the southern frontier is shared with Rumania and the remainder extends along the Black Sea, the Kerch' Strait, and the Sea of Azov.

It is impossible to depict the Ukrainian SSR as a natural geographic unit, submitting to easy definition. The broad and sweeping steppes of the uplands and lowlands are not uniquely Ukrainian, but actually are part of the greater East European Plain, or Great Russian Plain, spreading in many directions beyond Ukrainian borders. In the north, a wide band of marshland, typically a Belorussian terrain feature, covers thousands of square miles, while widely separated highland areas rise steeply over a limited part of the periphery in the west and south. Again in the south, an extensive coastline borders on the Black Sea and the Sea of Azov. Vegetation likewise fails to provide a basis for describing the Ukraine as a natural unit inasmuch as there are three broad landscape zones which spread latitudinally across the Republic. Climatically the greater part of the Ukraine partakes of the continentality characteristic of most of European Russia, although manifested less severely than in many areas. However, even though the Ukraine is not a distinct natural unit based on physiography or vegetation, it is clearly a distinct political unit, the limits of which have been justified on the basis of community of language and history.

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## 2. Terrain Features (See Map B)

### a. The Ukrainian Steppelands

The dominant terrain feature of the Ukrainian SSR is the wide, level to gently rolling, fertile steppeland which stretches from the Carpathian Mountains on the western frontier into the RSFSR on the east, and in the north from the inhospitable swamplands of Poles'ye southward to the Black Sea, the Sea of Azov, and into the Crimea. Throughout this vast area, accounting for about seventy-five per cent of the Ukraine, the basic pattern of land formation is one to discourage the operations of Special Forces. Like the Great Plains of the United States the Ukrainian steppes gently rise and fall with monotonous regularity, seldom varying in elevation by more than 500 feet; in most areas the limit of visibility is the horizon.

Regional variations exist within the limits of the Ukrainian steppeland, but in most cases these differences do not involve significant areas suited to refuge and evasion. On the periphery of the steppelands, however, there are several areas in which the terrain differs radically from that of the plains, offering excellent opportunities for long-term refuge and evasion. These areas are: Ukrainian Poles'ye, the Carpathian Ukraine, and the Crimean Mountains. They will be considered in more detail following a briefer description of the regional elements of the generally unsuited steppelands.

From the standpoint of Special Forces operations the most promising part of the steppeland is found in the upland areas west of the Dnieper River. This extensive upland, generally over 100 miles in width, trends northwest-southeast for about 500 miles from the Carpathian foreland and the Polish frontier to the great eastward bend of the Dnieper River. In the north and northeast it is defined by an escarpment facing the lowland of Poles'ye, and in the south and southeast it follows the line of the Dneestr River, finally merging with the Black Sea Lowland roughly along a line connecting the cities of Balta and Zaporozh'ye. The uplands region,

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or plateau as it is sometimes called, is composed of loess, underlain by various sediments on a crystalline base; there are places where river valleys are incised deeply enough to expose this base. The Yuzhnyy Bug divides the area into two parts: the Volyno-Podol'skaya Upland, which occupies all of the north, and the area between the Dneestr River and the Yuzhnyy Bug; and the smaller and lower Pre-Dnieper Upland which is largely confined to the area between the Yuzhnyy Bug and the Dnieper River.

The Volyno-Podol'skaya Upland ranges from about 600 to 1300 feet above sea level. Elevations are highest in the northwest, the upland sloping gradually toward the east and southeast. The erosive action of water has had a considerable effect on the upland surfaces. The valleys of the larger streams draining southward to the Dneestr are deeply cut, frequently having the appearance of canyons 300 feet or more in depth; the western valley slopes are steeper than the eastern. There is also drainage northward to the Bug and Pripiet Rivers. Removal of forest cover and other agricultural abuses have led to gullying elsewhere on the upland; steep-sided, branching ravines are common and sometimes attain a length of several miles and a depth of 100 feet. The broad interstream areas are plateau-shaped and contain a great number of round, various-sized, shallow depressions sometimes occupied by bogs or temporary ponds. The winding valley of the Dneestr, which strikes between the Volyno-Podol'skaya Upland and the Bessarabian Upland of the Moldavian SSR, is deeply incised, much of the valley floor being 300 to 450 feet below the surrounding heights. The valley ranges from under one mile up to five miles in width and has many marshy sectors.

The other upland area west of the Dnieper, the Pre-Dnieper Upland, has lower elevations than the Volyno-Podol'skaya Upland. The highest elevations, about 1,000 feet, are in the northwestern part; the average elevation is about 700 feet above sea level. Occupying the area between the Yuzhnyy Bug and the Dnieper River, the upland slopes gently toward the northeast, where it merges with the Dnieper Lowland, and toward the southeast, terminating in an escarpment along the right bank of the Dnieper.

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Its southernmost extension merges gradually with the Black Sea Lowland. The upland surface is cut by streams and gullies, but not as deeply as on the Volyno-Podol'skaya Upland. Many river valleys are broad and troughlike, with occasional small areas of poor drainage.

Upland areas are not as extensive to the east beyond the Dnieper. Only the southernmost part of the highly dissected, although nearly level, Central Russian Upland penetrates the Ukraine in the vicinity of Kharkov, rapidly losing its character as an upland north of the Donets River valley. Another upland area, the Donets Ridge, rises steeply to the south of the Donets valley, in many places being as much as 300 to 500 feet above the surface of the river, and occupies much of the area between the river and the Sea of Azov. In general the ridge has the characteristics of a gently rolling plateau with steppelike interstream areas. Orientation is WNW--ESE, for a distance of over 200 miles, and in places the upland is about 100 miles in width. The maximum elevations, attained south of Voroshilovgrad, are about 1,200 feet; most of the upland is in the 328 to 656 foot range (100 - 200 meters), but there are significant sections which fall in the 656 to 984 foot range (200 to 300 meters). As in other upland areas of the Ukraine the surface is penetrated by steep-sloped stream valleys and marked by gullying. A southwestern extension of the ridge, called the Pre-Azov Upland, closely approaches the shores of the Sea of Azov before merging with the Black Sea Lowland.

Two large lowland areas occupying the central and southern sectors of the Ukraine constitute the remainder of the steppelands. The northernmost of these, the Dnieper Lowland, adjoins the left bank of the Dnieper River and gradually merges into the Central Russian Upland on the east. In extension it is about 250 miles from northwest to southeast and 150 miles in width; this lowland continues northward beyond the Ukrainian border. Elevations rise from about 300 feet above sea level at the Dnieper River to over 500 feet upon merging with the uplands in the east. The terrain throughout

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is predominantly level with average slopes less than 2 per cent. Numerous left-bank tributaries of the Dnieper cross the region. Their right banks are generally higher than the left, and in spring floods inundations spread far and wide over the left bank areas contributing to the development of extensive meadowlands. These tributary streams generally have a slow current and become shallow in the summer. Part of the Dnieper Lowland immediately adjoining the left bank of the Dnieper is described as the zone of the Dnieper Terraces, a band of terrain stretching from Chernigov in the north to Dnepropetrovsk in the south; in places this zone reaches a width of over 75 miles. Subdivision of this terrace zone are largely defined in terms of altitude, soil, and vegetation. Thus they pass from the flood plain meadows, through dunes overgrown with pine groves, to the relatively higher elevations of the fertile steppe. A very small part of the Dnieper Lowland lies on the right bank of the river in an area west of Kiev. It merges in the north with the swamplands of Poles'ye, and in the south and west gradually ascends to the Pre-Dnieper Upland.

The other extensive lowland area in the Ukraine is the Black Sea Lowland. It extends for almost 500 miles from the western to the eastern limits of the Ukraine along the northern shores of the Black Sea and the Sea of Azov, and then continues eastward to the rolling plain of the Don River. Its extension inland ranges from 20 miles, in the eastern part, to over 100 miles in the area north of the Crimea. The Crimean Lowland steppe, constituting three-fourths of the entire peninsula, is a part of the Black Sea Lowland.

The outstanding relief characteristic of the Black Sea Lowland is the vast expanse of nearly level to gently rolling terrain. Elevations range between 100 and 300 feet above sea level and the monotony of the flat, treeless horizons is broken only by the shallow valleys of streams, local gullies, and occasional low hills. Granite outcrops of the underlying crystalline base and numerous ancient burial mounds provide relatively prominent breaks in the prevailing level plains. The lower courses of the

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Dnieper, Yuzhnyy Bug, and Dnestr, and many smaller, partly intermittent streams provide the drainage of the area. The steep right banks of the streams are commonly marked by gullies and ravines. Where the larger streams empty along the coast, long and narrow bays and estuaries (called limans) have been formed. These estuaries are the drowned valleys of lower river courses; some of them have become completely separated from the sea by spits. Throughout a great part of the coastal area, including the Crimea, short beaches are backed by low cliffs. The Crimean Peninsula is connected to the continental lowland by a five-mile wide isthmus. The greater part of the peninsula is level to gently rolling, ascending in the south, however, to the ridges of the Crimean Mountains. The Kerch' Peninsula, an eastward elongation of the Crimea between the Sea of Azov and the Black Sea, is also predominantly flat, but rises into a series of low ridges and hills around and about Kerch' at the eastern tip.

## b. Ukrainian Poles'ye

Of the areas in the Ukraine which show marked differences from the upland or lowland steppes, Poles'ye is the most extensive and inaccessible. Poles'ye is the name given to the vast, level, poorly drained lowland area that is roughly defined as occupying the basin of the Pripyet River. The area is more commonly known as the Pripyet Marshes and is famous as a major military obstacle, having served many times to divert invasions and counter-invasions to the easier ground lying to the north and south. The southern third of this marshland lies within the borders of the Ukraine and extends about 300 miles from the Polish frontier eastward to beyond the Dnieper River. It extends southward from the Ukrainian-Belorussian border to the Volyno-Podol'skaya Upland, a distance of about 80 miles in some places. Differences in elevation over the broad reaches of Poles'ye are not at all significant, there being only a difference of 180 to 262 feet between the center and the edges of the marshland. There are many sandy areas, often with westward-facing parabolic dunes, the whole characteristically bearing

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a growth of pine. On the whole, however, Poles'ye is one great flood plain with a few, predominantly sandy, dry valleys. Absolute elevation is in the 328- to 656-foot range (100 to 200 meters); there are a few small "islands" of terrain foreign to the area, the most remarkable being the Ovruch Ridge which attains an elevation of about 1,050 feet. The typical landscape is cheerless, being monotonously flat, wooded, and wet. Marshes and swamps cover most of the area which abounds in small sluggish streams and drainage ditches and canals. Interstream areas are low and almost completely given over to marshes and swamps. Soils are dominantly peat and muck with some sand and gravel on the low ridges. Spring thaws render any movement throughout the area almost impossible because of widespread flooding. Winter is the season most favorable to movement, depending on the depth to which the ground freezes. Late summer also offers somewhat better opportunities for travel. Despite its generally forbidding aspect, Poles'ye supports a moderate population and, in addition, has proved its worth as an excellent refuge and evasion area by supporting large-scale guerilla activities in the past.

## c. Carpathian Ukraine

The Carpathian Ukraine is a second area differing radically from the level plains and gently rolling uplands which cause so much of the Ukraine to be held unsuitable for the operations of Special Forces. In the Ukraine the Carpathians form a slight arc, trending northwest-southeast for about 150 miles. During their course from the Polish frontier across the westernmost sector of the Ukraine to the Rumanian frontier, the Carpathians reach the lowest and narrowest points of any section of the whole system. The total width of the parallel component ridges varies from about 60 miles in the northwest and central portions to over 80 miles in the southeast. Elevations increase gradually from northwest to southeast with most of the summits rising to between 3,000 and 6,700 feet; a maximum elevation of 6,752 feet is attained on the peak of Gora Goverla in the southeast. Longitudinal and transverse valleys provide an easy means of access

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and penetration over wide areas of the Carpathian Ukraine. A number of relatively low passes are available.

Three parallel ridges are distinguishable throughout much of the length of the mountains, although in the higher southeastern section longitudinal valleys are not as clearly defined. The central ridge, the highest and most extensive, has summits ranging from 3,000 to 6,000 feet and over, and varies in width from 12 to 24 miles; most of the summits of this range are dome-shaped although sharply defined peaks are encountered in the southeast. Large, nearly level alpine meadows are a common feature of the broad crests and are used as summer pastures as well as avenues of relatively unhindered movement. The northeastern slopes are short and frequently precipitous, whereas the southwestern slopes are longer. A longitudinal depression averaging 15 to 18 miles in width separates the central from the eastern ridge. In its southern part this eastern ridge becomes increasingly rugged and disorganized, local relief\* often exceeding 1,000 feet. The northern part is also ill-defined and resolves itself into a group of separate mountains. The westernmost ridge, divided from the central by a narrow depression, averages about seven miles in width. It is the lowest of the three ridges, varying between 2,500 and 3,300 feet above sea level. Summits are fairly level and the southwestern slopes decline gradually to merge with the foothills facing the Trans-Carpathian plain; the northeastern slopes are short and steep.

On the whole, the southeastern section of the Ukrainian Carpathians is the area best suited for refuge and evasion, although sections which are almost as rugged are found in the central portion. Even though elevations are not particularly high in the northwest, this section is still a significant barrier area. Gorge-like valley approaches, forests, and broken terrain greatly hinder traversability. The southeastern section, however, is

\* Local relief is defined as the difference between highest and lowest elevations within a horizontal distance of one mile.

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the highest, most isolated and inaccessible of all. Traversability, and therefore organized pursuit, would be most difficult here. The lack of natural approaches has resulted in sparse settlement. Relative relief is considerable in the western part of this section; differences of 1,000 feet per mile are not unusual. The valleys are narrow and steep, frequently having gradients of over 50 per cent.

The foreland areas to the northeast and southwest are occupied by foothills. On the northeast the foreland varies in width from a few miles to a maximum of about 30 miles. The slopes generally have gradients of less than 10 per cent, except where there are steep valley walls. The general elevation ranges from 760 to 1,000 feet, but there are places where elevations are greater, the maximum being 2,500 feet. The belt of foothills in the southwest is not as wide, ranging from six to nine miles, and there are places where the transition is abrupt and striking, the elevation between plains and mountains differing by as much as about 3,000 feet in ten miles.

Southwest of the Carpathian Mountains, the Soviet Union has acquired a strategic western gateway in the form of the Trans-Carpathian Plain. This narrow rectangular plain, about 20 miles in width, is oriented northwest-southeast along the strike of the mountains. It is a monotonously flat area, gradually sloping toward the frontier where it opens onto the Great Hungarian Plain, of which it is actually a part. The area is crossed by numerous braided streams bordered by swamps and marshes; drainage ditches, canals, and dikes present further restrictions on movement. The largest river, the Tisza, is a considerable barrier and is subject to widespread flooding. Vegetation on the plain offers few opportunities for concealment. A line of Soviet cities and towns marks the abrupt break between the Carpathian ridges and the plain.

#### d. The Crimean Mountains

The mountains aligned southwest-northeast along the southern coast of the Crimea provide one of the most striking departures from the monotonous

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terrain of the upland and lowland steppes of the Ukraine. The Crimean Mountains are strung out for about 100 miles along the Black Sea coast and extend inland approximately 30 miles. A narrow coastal strip, only a few miles wide, divides the mountains from the sea, except where occasional high, steep cliffs plunge directly into the water. In the north the boundary between mountains and steppe is somewhat north of a line defined by the cities of Sevastopol-Bakhchisaray-Simferopol-Karasubazar-Feodosiya.

The mountain system consists of three parallel ridges in the western sector, contracting to two in the eastern. Valley depressions of varying width divide the ridges latitudinally and steep transverse valleys and gorges, carrying most of the mountain drainage, tend to cut the individual ridges into a number of mountain blocks. Elevations are greatest on the southern ridge, decreasing on the central and northern ridges until the mountains merge with the steppe on the north.

The southernmost and highest ridge is called the Yaila. Elevations reach their highest point, 5,062 feet, on the Roman-Kosh, northeast of Yalta. The summit of the range is not a crest, but a rolling plain only a few miles in width, partly covered by meadows, and partly rocky. These "flats" are generally at elevations of between 3,000 and 4,500 feet above sea level and are strongly marked by numerous depressions, furrows, caves, and deep cavelike abysses. The southern, sea-facing slopes are extremely steep. On the western and eastern ends of the range they descend into the sea in the form of nearly vertical precipices which in places are a thousand feet high. In the central section the range recedes somewhat from the coastline, but remains noteworthy for its high precipices. Terraces and gullies are common, and deep divides, which resolve the Yaila into a series of individual plateaus and blocks, are also met with on the southern slopes. The extensive fissuring of the Yaila leads to damaging landslides and the entire mountain Crimea is subject to earthquakes. Northern slopes are much more gradual, descending to a depression about ten miles in width separating the Yaila from the foothill ranges

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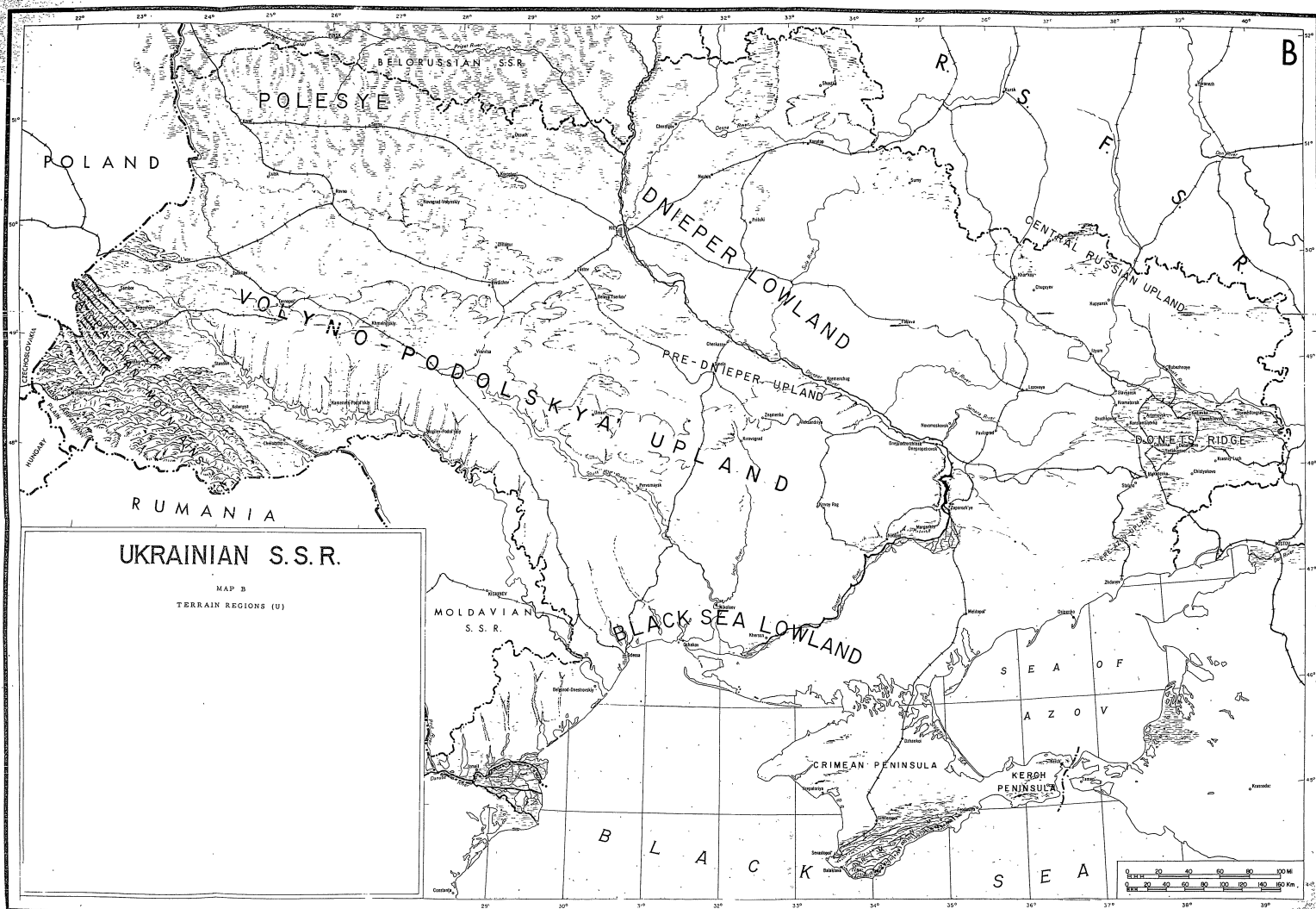
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to the north. A few low, rounded hills are found in this valley.

The second or central range is not nearly as impressive as the Yaila, either in terms of height or ruggedness. Actually this ridge is not a true mountain form, being rather the product of erosion. It varies from two to six miles in width and ranges in elevation from 1,300 to 2,400 feet along its summits. As in the case of the Yaila, southern slopes are steep and craggy while those on the north are much more gradual. In its eastern part, toward Feodosiya, this range is broken up into detached hills and basins. Water action has led to considerable erosion, cutting narrow gorges and dissecting the range into a number of separate plateau blocks.

The northernmost range is the lowest and least extensive, spreading eastward only as far as Stary Krym. Elevations range from about 400 feet above sea level at the northern base to a maximum of 1,000 to 1,200 feet on summits. South slopes are steep and in places terminate in cliffs; northern slopes descending to the Crimean steppe are gradual. Considerable erosion has taken place. A narrow depression, about two miles in width, divides this range from the central range to the south.

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3. Climatic Features (Maps C, D, and E)

The general weather pattern of the Ukraine is formed by continental influences. Maritime influences from the Atlantic Ocean are much less significant and are much reduced by the time they reach this area, growing progressively weaker from west to east; precipitation decreases from west to east and especially to the southeast. Although the Ukraine has a rather ~~temperate climate when compared with the other regions of the European part~~ of the USSR, continentality is manifested in cold winters and hot summers. The only major exception is the southern coast of the Crimea which has hot, dry summers and mild, rainy winters. The period of winter freezing varies from two months in the south to about three or three and a half months in the north. Snow cover is generally light. During the spring thaw season the rich Ukrainian soil is converted into a sea of mud that makes vehicular movement all but impossible for a period of three or four weeks. (In the swamplands of Poles'ye conditions are even worse.) Summers are hot and dusty, although much rain falls in the form of heavy thunderstorms. In the fall there is a second period of mud conditions, not as severe or prolonged as in spring.

In spite of the fact that the great bulk of the Ukraine has a rather uniform climate some variations which are of interest to Special Forces may be detected regionally. The regions are broadly divided into the highland areas of the Carpathian and Crimean Mountains (including the south Crimean littoral), the Poles'ye area, and the broad forest-steppe and steppe zones.

## a. Highland Areas

## (1) Carpathian Mountains:

The Carpathian Mountains are the most extensive highland area in the Ukraine. Although generalizations can be made about the climate of this region it must be kept in mind that elevation, slope, and exposure to sun and wind are all factors contributing to wide local variations. Precipitation is greater than in any other part of the Ukraine: it reaches 20 to

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28 inches at lower elevations and increases to from 30 to 48 inches annually in the higher elevations.

Winter, which is long and cold, is the most difficult season. Temperature usually falls as altitude increases from the valley floors to the mountain ridges, but temperature inversions frequently occur leaving the valleys clouded and the summits clear. The average January temperatures are 10°F. in the mountains and 20°F. in the valleys; daily temperature ranges are wide. Winter precipitation is heavy, snow accumulating to a depth of two to three feet on higher slopes. Strong winds result in drifting to a depth of several feet, often blocking mountain passes. Warm, dry föhn winds are experienced on the north slopes of ridges, particularly in the foothills. Warm clothing and shelter are a necessity throughout the winter season, and snowshoes and skis greatly assist movement. Spring comes rather late, except in the foothills, and snow may remain on higher shaded areas until June. Thaws, however, set in in March and greatly swell the volume of the Carpathian rivers and streams. Summer is very pleasant with warm, sunny days and clear, cold nights. Temperatures in the valleys average in the 60s in July and are about 20 degrees lower in the mountains. Precipitation is quite heavy, usually exceeding three inches in each summer month, much of it in the form of violent thunderstorms. Higher slopes and summits are often shrouded in clouds. Autumn is a brief transitional season and snow may appear on the higher elevations as early as September; it begins to accumulate in October. Dense morning fogs are typical of the season. Trans-Carpathia, sheltered from the cold northern and northeastern winds, is quite unlike the Carpathian Ukraine. Its climate is relatively mild, winters beginning later, ending earlier, and with less precipitation and snow cover. Summers are much warmer.

(2) Crimean Mountains (including the southern littoral):

The climate of Mountain Crimea, which area encompasses the southern coast, the Yaila, and the remaining ridges to the north, is quite uneven. The south coast lies on the outskirts of the region of Mediterranean climate, but has some features which are not associated with that climatic

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type. Thus, southwest winds prevail in summer, and northeast winds in winter. The seasonal distribution of precipitation, however, is more or less Mediterranean, with the greatest amount falling in winter and the least in August. Early spring is dry, but it is followed by a secondary maximum of precipitation in June and July. Average annual precipitation for the south coast is 15.5 to 19.5 inches, with the largest part deposited on the central sector. Summers are long, hot, and sunny, and witness strong evaporation, sometimes with long droughts. The mean temperature for July is over 70°F. and the daily temperature range is slight. Summer breezes are from offshore at night, and from the sea in the day. Autumn (September and October) is the finest season, being calm and with much sunshine. The bathing season sometimes extends into October. Winters are mild with the Crimean Mountains holding back most of the cold, continental air from the north. The southern coast never has temperatures lower than 60°F., and the mean temperature there during January is not much under 50°F. The vegetation pattern continues throughout the year, although there are frosts.

Climatically the Yaila is transitional between Mediterranean influences and the harsher climate of the northern ranges of the Crimean Mountains. Precipitation is rather heavy, averaging between 19.5 and 39 inches, but reaching over 55 inches in some years. The number of days with precipitation is also considerable--one out of three days in summer, and two out of three in winter. Some rain showers are exceptionally heavy. The maximum rain falls in winter, the minimum in August. Snowfall is heavy, there being about 60 days a year with snow, and the snow cover lingers on into spring and, in places, even into early summer. Fogs are also frequent, occurring on more than 100 days in each year. The mean July temperature is about 66°F., and in January a mean of 24.5°F. has been recorded at one station. Winds of considerable force are everywhere encountered on the Yaila.

The remainder of Mountain Crimea is made up of the lower ridges north of the Yaila. The continentality characteristic of most of the Ukraine

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begins to assert itself in this region with hot summers and cold winters. Down to an elevation of about 1,600 feet the prevailing climate approximates that of the deciduous forests of the middle latitudes; at lower elevations that of the steppe or forest-steppe. Precipitation ranges between 11.5 and 19.5 inches, the maximum falling as rain in June and July, and the minimum in spring or late winter.

## b. Poles'ye

Poles'ye, the vast, swampy lowland on the Northern border of the Ukrainian SSR, has a continental climate, more or less uniform throughout. The annual range of temperature is considerable. Winters are cold, although occasionally interrupted by days with thaw weather; summers are sunny, and because of the sultry, humid heat, quite oppressive. The transitional seasons of autumn and spring are brief, and spring is characterized by widespread flooding.

Winter lasts from early November to early April. It is the season most favorable for movement. Snow cover is first observed in October, but a lasting snow cover, suitable for sled traffic, cannot usually be counted upon until the last third of December. Streams also freeze in December and remain frozen into March. The snowfalls which occur early in the season are deceptive because without a preceding period of intense frost the wide, moory tracts hardly freeze at all, or insufficiently, and remain untrafficable. In late March the period of spring thaw commences. Snow-melt water mixes with the ground water of the upper surfaces and as the thawing process continues run-off and evaporation fail to keep pace and the waters rise and the mud deepens. Although high water level exceeds low water level by only several feet, this rise is enough to flood large areas because the adjacent land is low. Only when the ground frost is completely dissipated is there a reversal of the pattern, usually in early May. Then a brief period of fair weather with drying winds usually suffices to restore the area to its normal situation. Summer, which extends from early May to early October, has a July mean daily maximum temperature ranging from 70 to 75°F. and a mean daily

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minimum of 55°F. Occasionally the temperature rises to 95°F. and above; nights can be quite cool, the temperature at times dropping to 34°F. Summer heat and the permanently moist air cause frequent thunderstorms over Poles'ye. Vapor-charged air hangs as a haze over the area adding to the oppressiveness. Protection from mosquitoes, present in myriads, is necessary. Autumn is brief and relatively dry, although as it blends into winter the alternating frosts and thaws, along with early snows, lead to a second and period, much less severe than that experienced in the spring of the year.

Total annual precipitation is over 20 inches and fairly evenly distributed throughout the year. The maximum is reached in the hot summer months of July and August when over six inches of rainfall is common, much of it in the form of heavy thunderstorms. Poles'ye is a noteworthy area of fog formations which may occur in any month.

## c. The Forest-Steppe and the Steppe

The zones of the forest-steppe and steppe constitute, by far, the greatest part of the Ukrainian SSR. It is in these vast areas, which have no well-defined dividing line, that the continental climate mostly clearly and uniformly prevails, there being no terrain barriers to prevent or alter the sweep of climatic forces. Latitudinal influences, although not pronounced, gradually make themselves felt. The rigors of continentality, on the other hand, are increasingly in evidence from west to east in the form of colder winters and hotter, dryer summers. The Dnieper River serves to divide the forest-steppe into the Volyno-Podol'skaya Upland to the west, and the plain of the Middle Dnieper to the east. The steppe zone spreads southward all the way to the Black Sea and the Sea of Azov and over most of the Crimea.

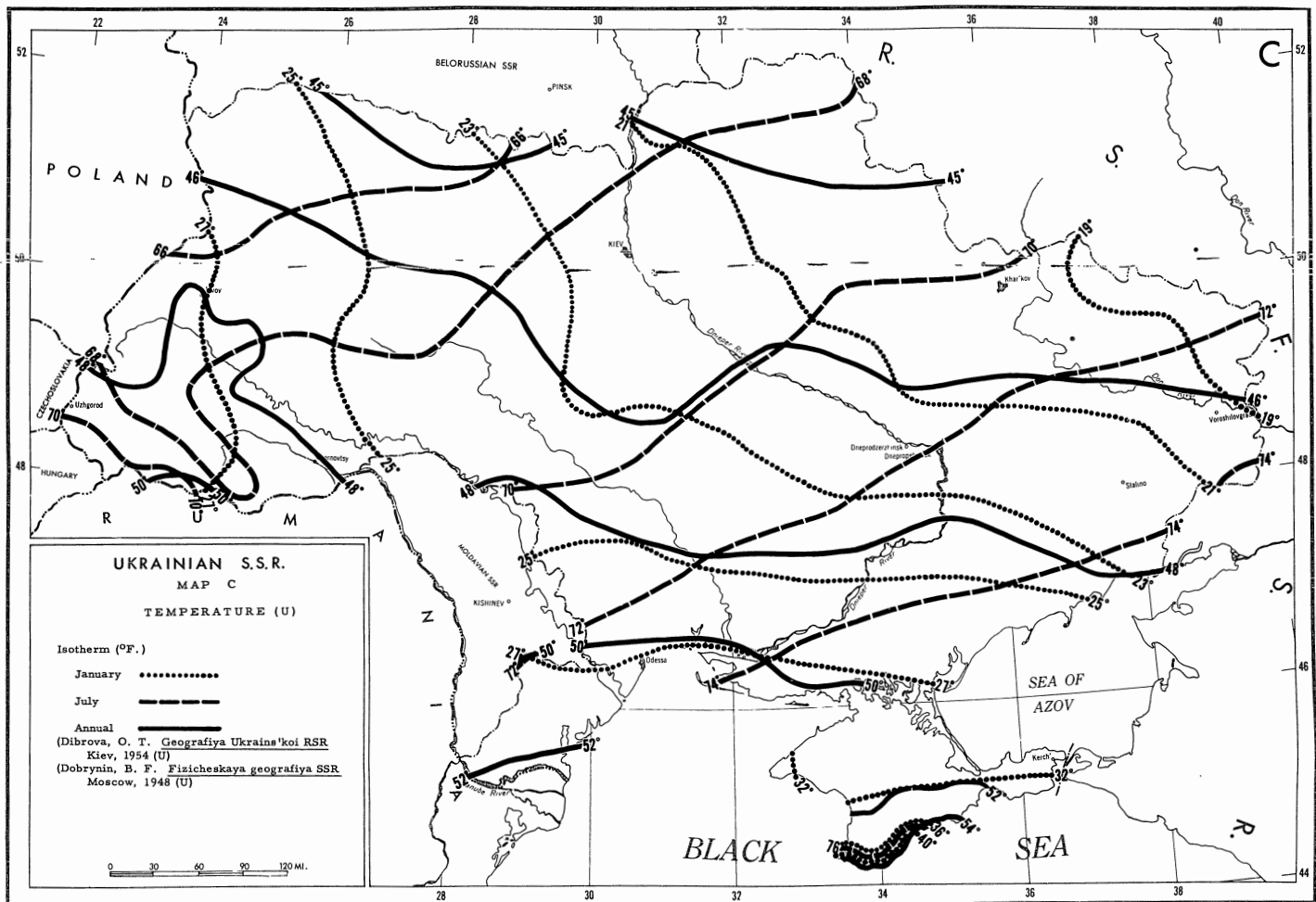
The forest-steppe is a transitional zone climatically as well as vegetatively. In its northern part it is well favored with moisture, like the forest zone; in its southern part it partakes of the warmer

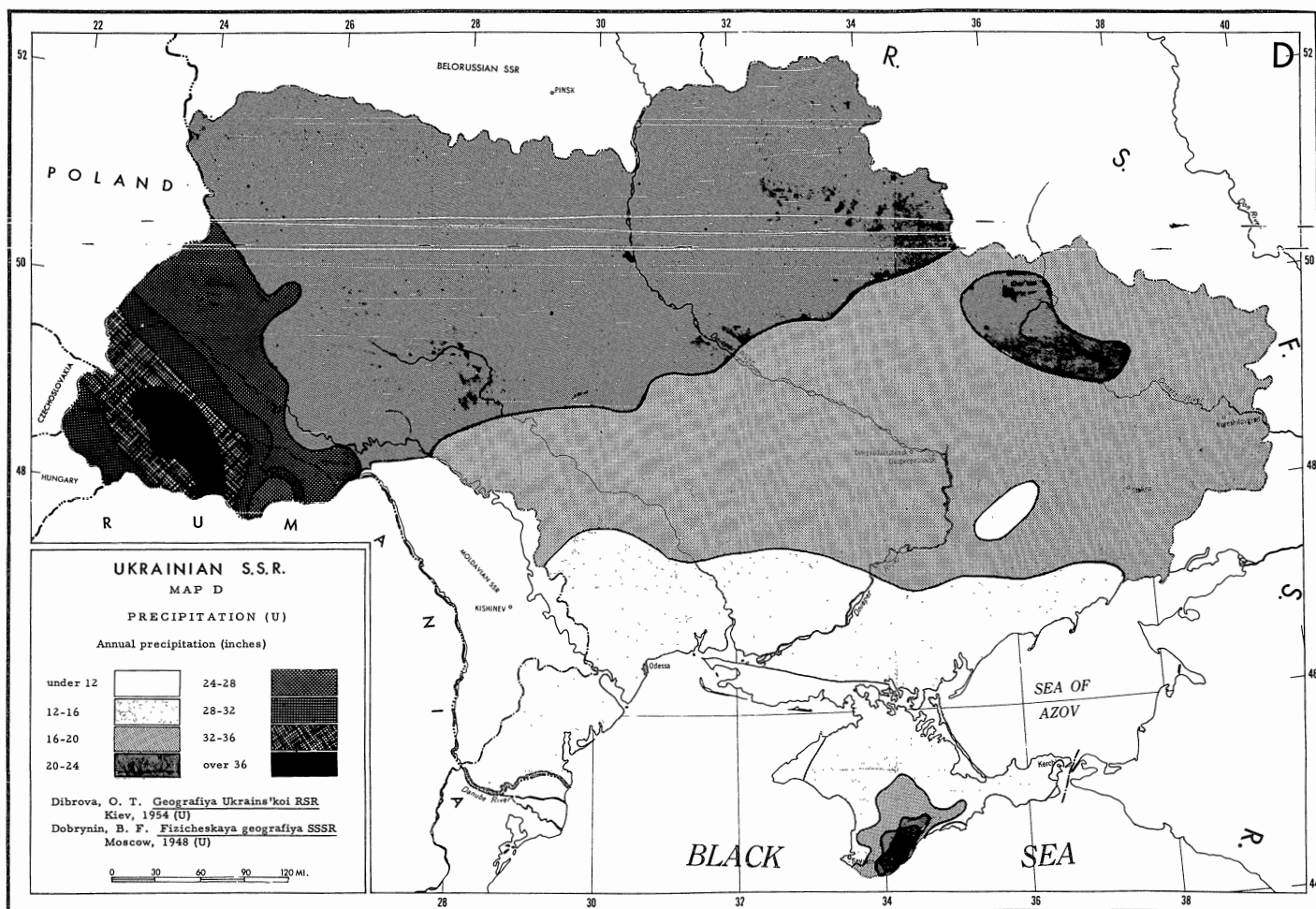


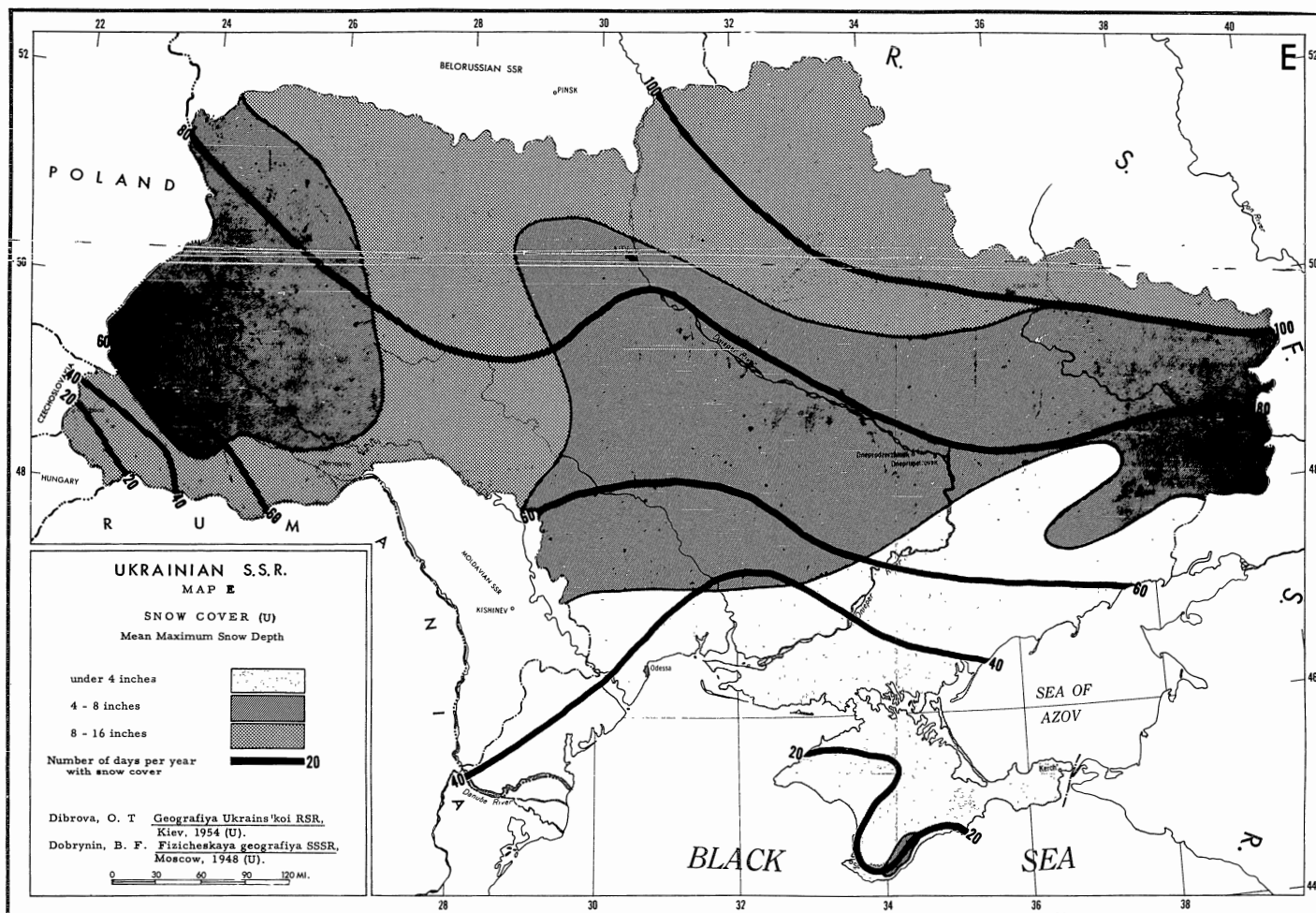
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and dryer influences which prevail on the steppe. Average July temperatures are almost 70°F., but extremes have exceeded 100°F. at many stations. January temperatures decrease in proceeding eastward and can be quite bitter; L'vov has registered -28°F., and Kharkov -34 F. The mean for the coldest winter months is, of course, much higher--in the vicinity of 23°F. Violent winds sweep the Volyno-Podol'skaya Upland in the winter, making it necessary to protect railway lines from drifting snow. Maximum precipitation comes in the early part of the summer, and the minimum in January and February. As in other areas, spring thaws turn roads into quagmires.

The steppe zone to the south is warmer and has hot, dry summers, the Black Sea exercising less influence than might be expected. The mean temperature does not fall below 68°F. In late summer a hot, dry wind (sukhovey) frequently blows with considerable velocity, generally out of the east or southeast, sometimes carrying sand or dust. In the face of this, temperatures quickly soar to 100°F. and over, and the humidity falls rapidly. The hot, dry, and dusty winds of the sukhovey can result in great damage to crops. In addition, it is a time in which the broad fields are particularly sensitive to conflagrations. Annual precipitation on the steppe, much of it in the form of summer thunderstorms, varies from 16 to 12 inches, but in the southeast may amount to as little as eight inches. In some summers there may be no precipitation at all for a month or more. Potential evaporation is great, actually exceeding precipitation. Winter snow cover is not deep, varying from seven to ten inches in the north to two to three inches near the Black Sea. It disappears as early as February in the coastal area and parts of the west. Although winter temperatures are not as extreme as in the north, they nonetheless require that adequate clothing and shelter be made available to all personnel. Odessa has recorded temperatures of -14°F., and even in the Crimea, -13°F. has been registered at Kerch', and -4°F. at Sevastopol'. However, for the most part, the 24° winter isotherm passes north of the steppe zone. Spring comes earlier than in the forest-steppe and results in similar untrafficable conditions.







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4. Vegetation (Maps F and G)

Within the borders of the Ukrainian SSR there are three broad latitudinal landscape zones which can be defined largely on the basis of their vegetation. From north to south they are: (1) the zone of mixed forests, (2) the forest-steppe zone, and (3) the steppe zone. In addition, there are two well-forested highland areas, (4) the Carpathians and (5) the Crimean Mountains, which are but little influenced by the latitudinal zones in which they lie.

## a. The Zone of Mixed Forests

The zone of mixed forests (actually a subzone of the vast forest zone of the USSR) is one in which broad-leaved species appear in company with conifers. In the Ukraine this zone closely approximates the southernmost extension of Poles'ye. Oak is the characteristic tree of this zone, intermixed with spruce and pine. However, the same deciduous species which grow in the taiga, such as birch, aspen, alder, and linden, are found in company with elm, maple, ash, and hornbeam. North of the Ukraine, and particularly north of the Pripyet River, the distribution of spruce is continuous. In the Ukraine, however, the mixed forest is a much more general feature and spruce is generally found in isolated islands on the outskirts of bogs, or on valley slopes.

In terms of cover, the zone of mixed forests far exceeds in suitability for Special Forces operations the forest-steppe and steppe zones. It covers a wide area in the northern Ukraine, spreading eastward for about 300 miles from the Polish frontier to beyond the Dnieper River, and extending southward from the border with the Belorussian SSR for over 80 miles in many places. Over a quarter of the total surface is covered with forest, and there are broad sectors where the density of the forest cover ranges from 25 to 40 per cent and more (see Map F). In some places there are patches of open, grass-covered land that provide fodder for cattle. On the whole, however, the region is covered by heavy forests of deciduous and evergreen trees with a dense undercover of tall grass reeds and underbrush. The

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thick growth provides excellent cover for unconventional warfare operations and the extensive swamps form a major obstacle to military activities directed against such units. The ability of partisan bands in this region during World War II to survive and the effectiveness of their operations underscore this evaluation. The sparse road and rail networks have had little effect on the natural isolation of the region.

## b. The Forest-Steppe Zone

The forest-steppe zone is one of transition between the forest zone of the north and the steppe zone on the south. The typical forest-steppe landscape is one in which forest complexes alternate with vast stretches of steppeland, or in which coppices are scattered in patches over a background of steppe. In areal extensions this zone proceeds southward from Poles'ye over most of the Volyno-Podol'skaya Upland. East of the Dnieper the southward extension follows a varied course roughly between the parallels of 49° and 50° North latitude. South of this line the relief on the Donets Ridge has led to the establishment of a large island of forest-steppe.

Oak is the characteristic species of this zone, but ash, linden, aspen, elm, maple, and hornbeam are common. Beech groves are found in the western part where the climate is mild and moist; pine, practically the only conifer growing on the forest-steppe, is encountered in sandy areas on the Dnieper terraces. The steppe areas of this zone are much greater than the forest areas. The entire area was once steppeland, but gradual climatic changes have led to the encroachment of forests which would in time be dominant but for the interference of man. As it is, the demand for agricultural land has more than kept pace with the slow advance of the forest, and the fact that the region is termed a "forest-steppe" is more for purposes of geographical classification than to indicate that forests at present vie with the open steppes for the dominance of the landscape.

There are a few areas of limited size within the forest-steppe zone of the Ukraine where small resistance bands or Special Forces units might find shelter for short periods of time. Along many of the river valleys wooded

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areas are found extending from the river banks for distances of as much as eight miles on each side. In many cases the banks are lined with villages so that even the presence of woods would not guarantee that unconventional warfare units would escape detection. However, in certain areas around the Dnieper and Donets Rivers and in the San Dnestr River Valley there are larger wooded sections which are sparsely populated. Southwest of Cherkassy on the west bank of the Dnieper River there is a wooded marshland of approximately 180 square miles which is covered with oaks and birch thickets and which has only a scattered population. Along the banks of the Donets River west of Izyum, and in the western Ukraine northwest of L'vov other wooded areas are found. None of them are larger than 200 square miles and in some cases the woods are not thick. However, all provide limited possibilities for concealment.

Forest density in the forest-steppe zone is generally less than 10 per cent, but in some of the areas mentioned above it rises well above this figure. Conditions are best in the westernmost part of the Volyno-Podol'skaya Upland near the Polish frontier where the density of cover ranges between 15 and 25 per cent although there are wooded expanses near L'vov where forest density goes as high as 40 per cent (see Map G). This region sustained considerable partisan activity during World War II.

## c. The Steppe Zone

The final and southernmost landscape zone is that of the steppe, characterized by an almost total lack of forest cover. The southern boundary of the zone meets the shores of the Black Sea and the Sea of Azov, and, in the Crimea, the southern mountains. The typical landscape consists of grassy steppes and broad cultivated fields. The little forest cover that is available is confined to floodplains of rivers, slopes of river valleys, or narrow sandy terraces which lie above the river floodplains. Although trees are scarce, their variety is great. Elm, oak, ash, poplar, willow, maple, alder, aspen, birch, and some pine are found here and there.

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The steppe zone is the least favorable of any part of the Ukraine for the operations of Special Forces. The greater part of the zone is classified as having less than two per cent of its area under forest. The remainder is hardly more favorable, ranging only from two to five per cent under forest. The only sizeable area of forest cover in the entire region lies east of Dnepropetrovsk in a bend of the Samara River where a sandy terrace encourages forest growth in a 150 square mile section.

#### a. The Carpathians

The mountainous regions of the Ukraine are confined to a comparatively small section of the Western Ukraine--Carpathian Ukraine--and to the southern edge of the Crimean Peninsula. These two areas, although limited in extent, possess some of the most suitable vegetation cover in the Ukraine.

That part of the Carpathian Mountain chain which lies within the borders of the USSR stands out as the most thoroughly forested section of the Ukraine. The mountains lie at the western end of the forest-steppe zone, but are not a part of it, more accurately constituting an island of true forest. In the lower-lying parts the forests have been considerably cut over to make way for agriculture, but in the more rugged and inaccessible sections (central and southeastern), mountain slopes are still covered with excellent forest stands. The lowest altitudinal zone--that of the foothills--has suffered most from clearing; where forests still remain, they are composed of oak, hornbeam, and beech. Higher--at about 1,000 to 2,000 feet--the broadleaf forests of oak, hornbeam, beech, linden, maple, and elm begin to receive an admixture of the conifers--fir and spruce. At higher elevations the admixture tends to be limited to conifers and beech until at about 4,000 feet spruce forests prevail. The upper limit of the forest zone is reached at a little over 5,250 feet. Subalpine meadows and scrub thickets dominate the summits above the timberline.

Possibilities for concealment in the forest belt of the Ukrainian Carpathians are excellent. Many individual forests offer continuous cover over hundreds of square miles. Although the deciduous forests on the lower reaches of the mountains have largely a seasonal value as cover, the thick evergreen

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stands on the upper slopes provide excellent year-round concealment, and forest density here frequently exceeds 40 per cent. Forest density, in general, decreases with altitude. The forests of the Carpathian Ukraine were the site of much partisan activity during World War II and have continued to be the chief focal point of post-war resistance to the regime.

#### e. The Crimean Mountains

The Crimean Mountains and the southern littoral constitute a narrow geographical band lying between the Crimean steppe to the north and the Black Sea to the south. The most characteristic feature of the littoral strip is its subtropical vegetation, supported by a Mediterranean climate which also encourages orchards, vineyards, and tobacco plantations. The rich Mediterranean vegetation, however, does not extend very far up the mountains and soon gives way to juniper and oak forests, which, in turn, are dominated at higher levels by beech forests admixed with Scotch pine, maple, and hornbeam. Juniper thickets form an upper fringe to the beech forests and extend up to the Yaila summits. The summit itself is largely unforested, but there are some thickets and even occasional small beech forests. Descending the northern slopes of the Yaila, beech and hornbeam forests with stands of Scotch and Crimean pine are encountered, grading into oak and hornbeam at lower elevations. Below, the characteristics of the forest-steppe zone re-assert themselves, with oak, pear, and hornbeam predominating, continuing northward to the lowest and northernmost ridge of the Crimean Mountains where the treeless steppes are met.

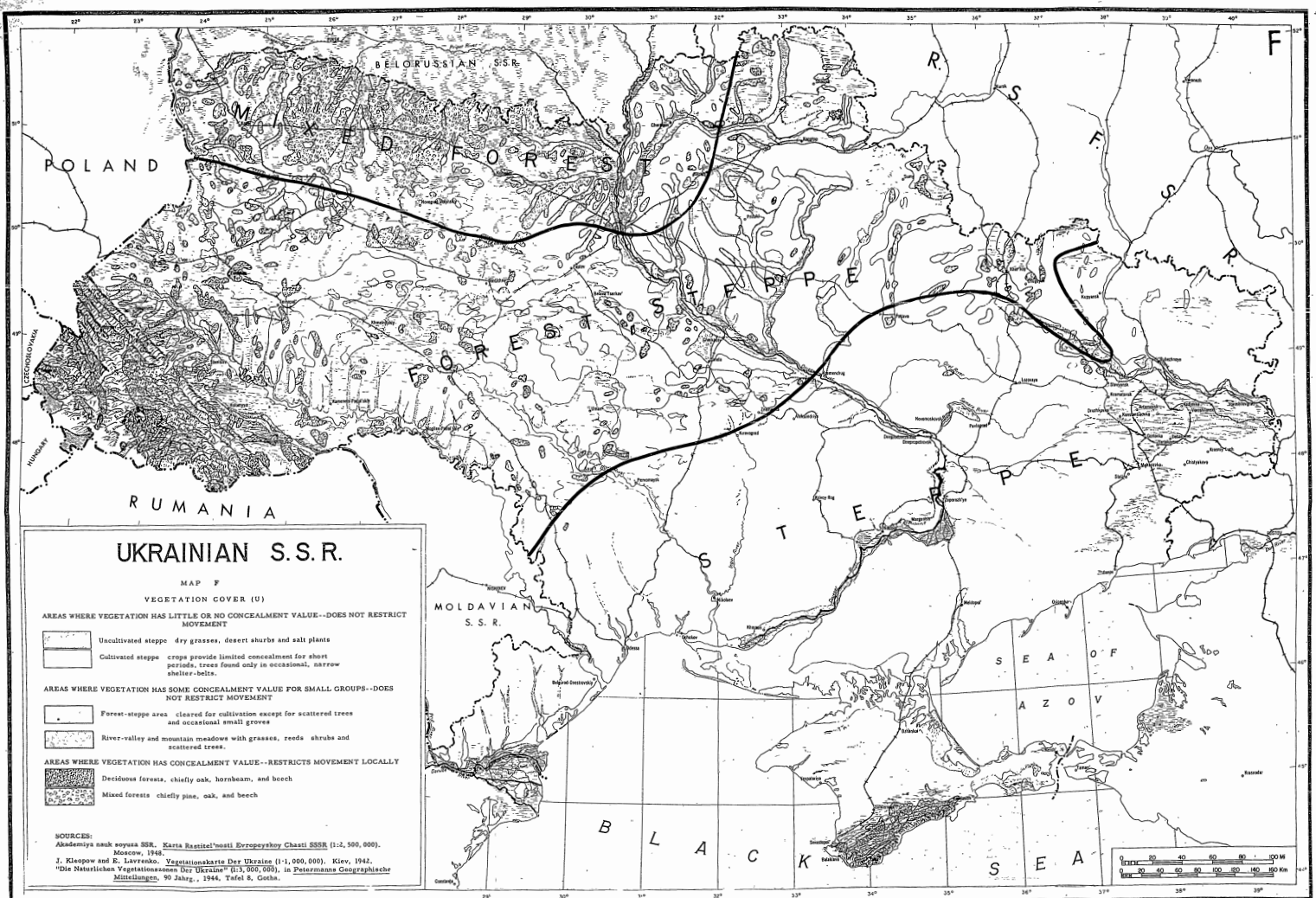
Concealment possibilities on the summit of the Yaila are limited, but the thick forests on the northern and southern slopes of this highest of the Crimean ranges offer many opportunities for refuge and evasion. The two northern, and lower ridges of the Crimean Mountains have a thinner forest cover and less rugged topography than the Yaila. In fact, both ridges have large areas which are unforested or which have been cut over

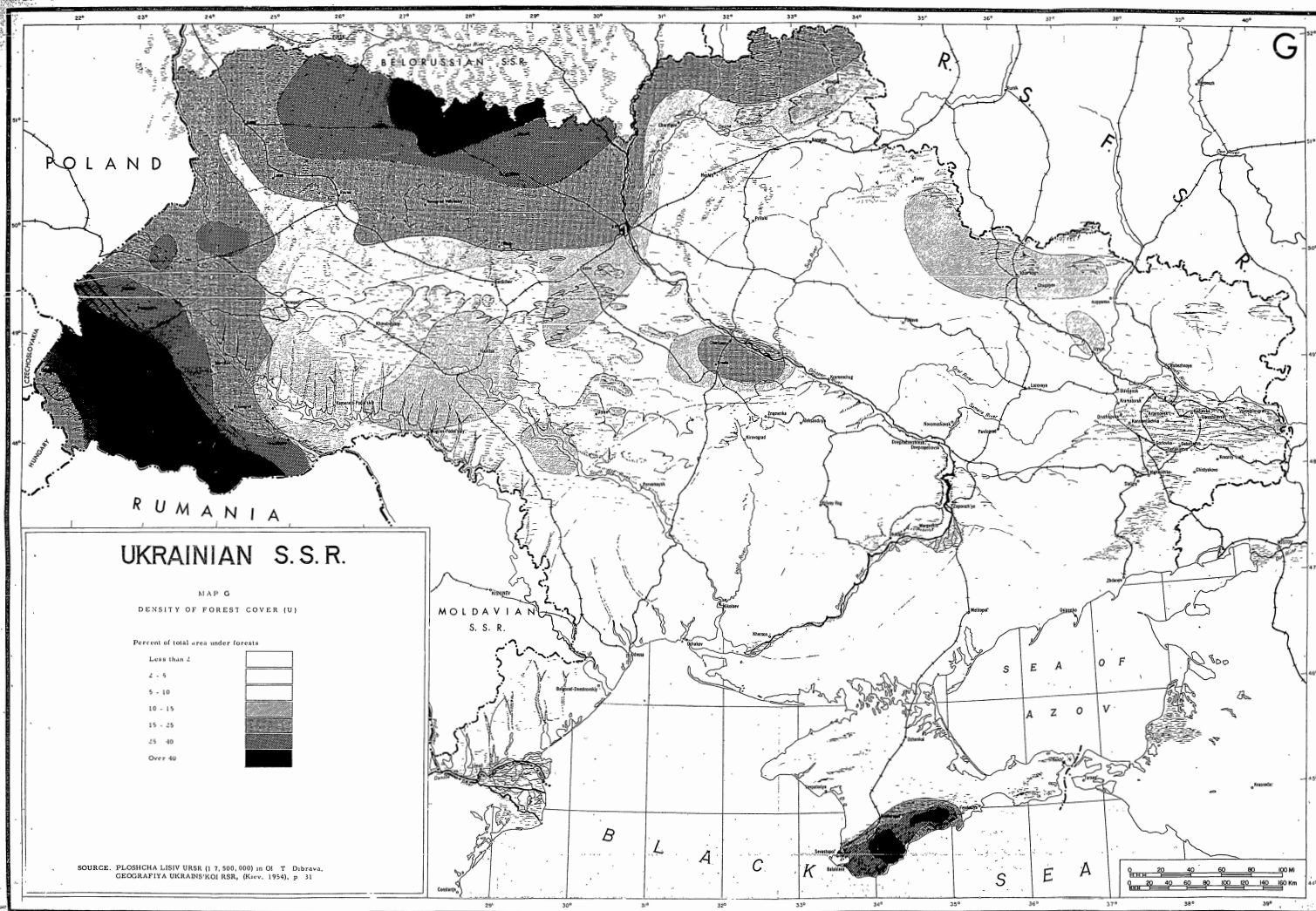
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and cleared. There are, however, many stretches, particularly in the valleys, where good forest cover is available in company with thick underbrush. On the whole, the undergrowth throughout the forests of the Crimean Mountains is not heavy, reducing somewhat the value of these forests for concealment from ground observation. However, the unbroken extension of forests over many square miles of difficult terrain compensates in a large measure for the lack of undergrowth.

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5. Cross-Country Movement (Maps H and S)

Conditions of terrain and climate are generally favorable to cross-country movement on foot throughout the Ukraine. Aside from the larger streams which are everywhere a barrier to movement except when frozen, the major areas in which movement would be sharply restricted, and at times prohibited, are Poles'ye, Carpathian Ukraine, and the Crimean Mountains.

The vast marshes of Poles'ye are perennially wet. Movement in any direction encounters very difficult conditions, although some local movement is more easily accomplished in a north-south direction on long, narrow strips of dry land along the slightly higher left banks of the major streams. Spring is the least favorable season in Poles'ye; at that time, thaws lead to widespread flooding. Winter is the most favorable season after the moist ground and open water has had sufficient opportunity to freeze. Low water level is reached in August and its arrival expands to a limited degree the possibilities for movement. A second high-water period comes in autumn but does not usually create conditions as severe as those in spring. Despite its forbidding aspect the marshes, swamps, and forests of Poles'ye have demonstrated their value as refuge and evasion areas in the past. During World War II large bands of guerillas were able to sustain themselves for long periods of time in this area.

The highland areas of the Carpathian Ukraine and Crimean Mountains also present marked obstacles to movement on foot. Steep or precipitous slopes, rough surfaces, and deep, narrow gorges would severely hamper or channelize movement. The summit regions, however, are frequently broad and rather level and would provide avenues of relatively easy movement. The most difficult season in the highland areas occurs in winter when deep snows and strong winds result in the formation of high drifts. Mountaineering experience and special equipment would be particularly useful in this season but would also prove valuable throughout the year.

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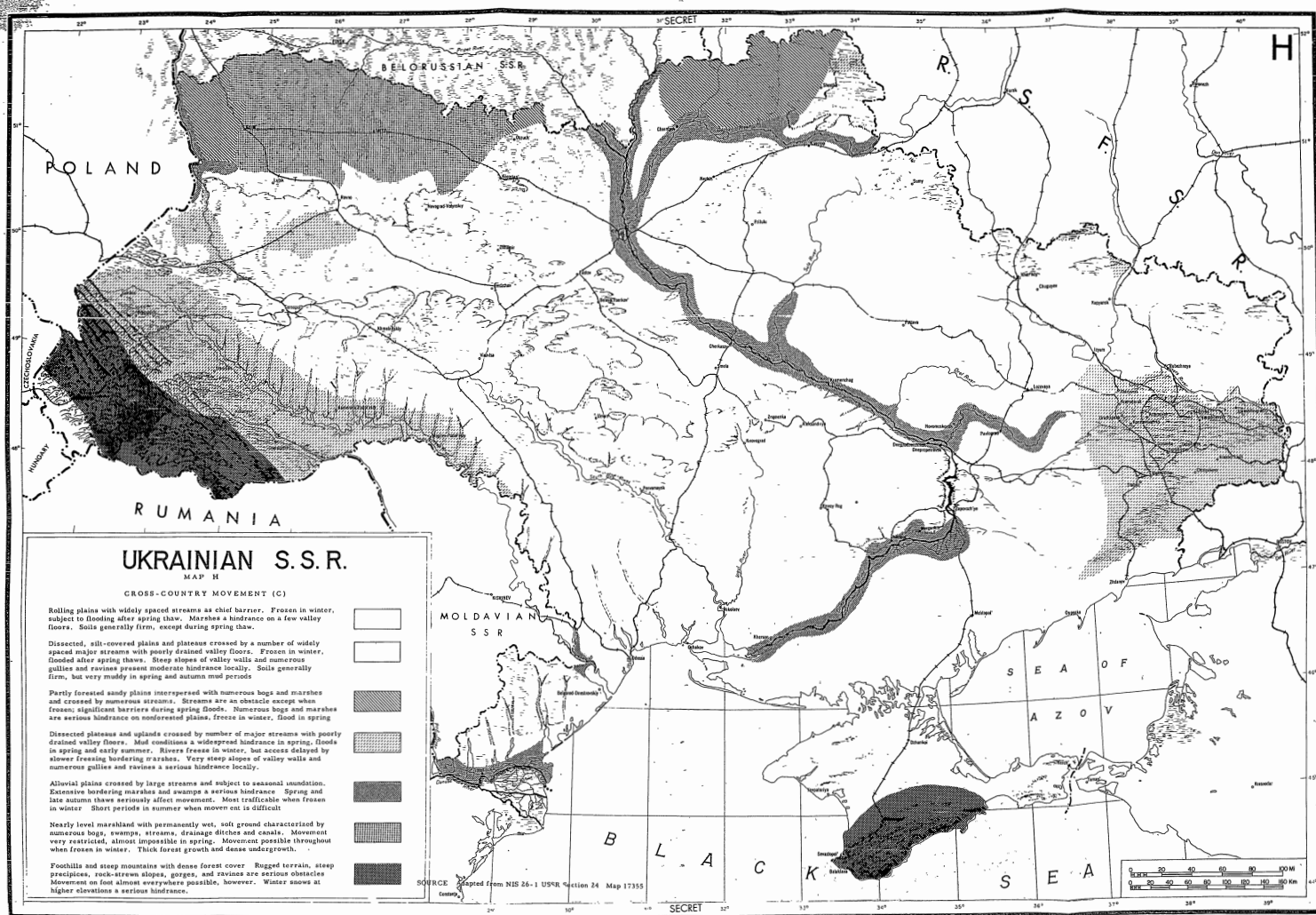
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As in the case of Poles'ye, these two highland areas were the refuge of large guerilla bands in the past.

The remaining areas of the Ukraine are made up of upland or lowland steppes. In these areas are found broad, unfordable streams, frequently margined by swamps and marshes. Primary dissection in the plains areas is due to the sometimes deeply incised valleys along which the streams flow. High banks would hinder movement locally. For details on some of the major Ukrainian rivers see Map S. Elsewhere on the plains erosion has led to the formation of long, deep ravines and gullies. Spring thaws have a far-reaching effect on the traversability of the plains, creating serious mud conditions and flooding wide areas adjacent to streams. Winter snows are not deep and next to the dry, dusty summers this season is the one most favorable to movement. Autumn witnesses a second mud period, not as serious as that of spring.

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6. Land Utilization (See Maps I and J)

The Ukraine occupies the most fertile region of the Soviet Union and as a result is more heavily cultivated than any other section of similar size. Although including only 2.6 per cent of the total area of the USSR, the Ukraine contains nearly 25 per cent of all arable land and over 20 per cent of all land under cultivation. In 1955, approximately 55 per cent of its area was cultivated--a figure approximately  $5\frac{1}{2}$  times greater than the average for the Soviet Union as a whole. Because of the large sections of the Ukraine under cultivation, possibilities for escape and evasion are generally poor.

a. Cultivated Land

The various uses to which land is put in the Ukraine are listed in Table III. Of the more than half of the total area which is cultivated, the largest part--nearly 66 per cent--is under grains. In the past, the predominant grain crops have been wheat (40 per cent), rye (12 per cent), barley (11 per cent), and oats (5 per cent). However, after World War II a campaign was inaugurated to increase the area planted to corn, and by 1956 the crop had been expanded to cover nearly 23,000 square miles, becoming as a result second only to wheat in importance (22 per cent). In the future the program is to continue with a planned corn acreage in 1957 of more than 27,000 square miles. It is possible that in future years corn crops will become as widespread as wheat, if wheat production under the virgin lands development program for Kazakhstan fulfills the expectations of Soviet planners. The increased corn production program is largely a reflection of the growing importance of the Ukraine as a livestock production center of the USSR.

Grain crops predominate in all sections of the Ukraine. They occupy more than 60 per cent of the cultivated land in every oblast except in the southwestern corner (I'vovskaya, Drogobychskaya, Stanislavskaya, Chernovtskaya, Zakarpatskaya) where they total 50 to 60 per cent. The principal grain producing regions lie in the flat, unforested steppes of

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T A B L E III  
LAND UTILIZATION: UKRAINIAN SSR\*

Oblast	Type of Land Use (Percentage of Total Area)					1955		Forested Land	Hayfields and Pasture Land	Other and Unused**
	Grain	Technical Crops	Potatoes & Vegetables	Fodder Crops	Total	Grain	Technical Crops			
Cherniavskaya	38	8	5	11	62	12	10	12	10	16
Chernigovskaya	31	4	7	7	49	18	18	20	18	20
Dnepropetrovskaya	27	5	6	8	46	13	16	25	16	19
Drobytskaya	47	3	4	9	63	3	13	3	13	18
Kharkovskaya	39	3	4	10	56	38	8	8	10	21
Khersonskaya	42	3	3	12	60	3	3	3	13	16
Khmelnitskaya	41	8	4	11	72	6	9	2	9	17
Kirovogradskaya	49	7	7	8	71	20	13	2	11	15
Kiyevskaya	32	4	1	11	51	9	27	9	13	16
Krymskaya	31	2	7	8	48	25	12	25	12	21
L'vovskaya	24	3	3	12	42	1	1	1	19	16
Nikolayevskaya	44	4	3	10	61	2	2	2	18	18
Odesskaya	43	7	3	10	63	3	3	3	12	23
Poltavskaya	41	4	4	10	60	25	2	25	21	25
Rovensskaya	18	2	5	4	29	2	34	2	11	27
Stalinskaya	39	4	5	12	60	3	10	3	12	19
Stanislavskaya	17	3	8	4	32	10	59	10	6	11
Sumska	36	6	7	11	70	13	13	13	7	13
Terнопольskaya	43	6	10	10	70	20	34	20	21	25
Vinnitskaya	45	2	6	10	63	3	17	3	25	21
Volynskaya	22	9	3	4	38	14	17	14	24	15
Voroshilovgradskaya	34	2	3	11	50	1	6	1	19	13
Zakarpatskaya	3	1	3	11	17	25	1	25	1	21
Zaporozhskaya	48	4	3	6	61	1	1	1	1	15
Zhitomirskaya	28	4	3	11	46	25	1	25	11	21
Ukrainian SSR	36	5	5	9	55	11	15	11	15	19

\* Source: Data on cultivated land taken from Statystychnye Upravlinnya Ukrainy i kol' SSR, Narodne Godopodarstvo Ukrainy kol' SSR (Kiev, 1957) pp. 120, 123-25. Other figures are estimates. \*\* See accompanying text.

the Black Sea Lowland and in the northern half of the Crimean Peninsula. In the seven oblasts which form these districts (Odesskaya, Dnepropetrovskaya, Zaporozhskaya, Khersonskaya, Krymskaya, Nikolayevskaya, Kirovogradskaya) grain crops occupy about 70 per cent of the cultivated land. Other important grain areas are found in the Voroshilovgradskaya, Poltavskaya, Kharkovskaya, Zhitomirskaya, and Stalinskaya oblasts.

Possibilities for concealment and evasion are generally poor throughout the grain-producing areas. In the southern steppelands where the ground is level or only gently rolling and where there is little natural vegetation, the grain fields extend in vast, almost unbroken stretches. Vegetation cover is to be found only in occasional shelter-belts 30 to 50 feet wide. In the northern districts fields are smaller and are sometimes broken by wooded patches. The crops themselves offer few concealment possibilities. Fields of corn provide excellent cover in the early fall months--August, September and October. Other grain crops reach only moderate heights and are not adequate for concealment.

The second largest category of crops is fodder, excluding corn. The Ukraine is the principal center in the Soviet Union for livestock based on cultivated forage rather than on grazing and pastureland, and its importance is reflected in the large areas devoted to the raising of livestock feed. Approximately nine per cent of the Ukraine's total area or seventeen per cent of its cultivated land is given over to these crops. Under the recently announced campaign of Soviet leaders to increase production of meat and dairy products these areas will probably be expanded.

Third in importance to grain and fodder are crops of vegetables and potatoes which now occupy over 11,000 square miles or nearly nine per cent of the total cultivated area. Vegetables are found chiefly in suburban areas around the major industrial complexes of the Ukraine. The mining and industrial centers in the Donbass and the Dnieper Bend are surrounded by kolkhozes devoted primarily to raising vegetables and



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to subsistence farming. The areas near the cities of Kiev, Kharkov, Odessa, Kirovograd, Krivoy Rog and Nikolayev-Kherson are similarly planted. Potatoes are found above all in the westernmost oblasts of the Ukraine (Stanislavskaya, Drobychskaya, Zakarpatskaya, L'vovskaya, Rovenskaya, and Volynskaya) where they occupy nearly a quarter of the cultivated land. They are a dominant crop also in a belt running through Poles'ye in the Zhitomirskaya, Kiyevskaya, Chernigovskaya, and Sumskaya oblasts. In most cases potato fields are found amidst marshes or woodlands; as a result, the districts in which they are found offer better possibilities for evasion than do other cultivated areas in the Ukraine.

The fourth principal category of crops are technical crops consisting chiefly of sugar beets and sunflowers. Sugar beets are found on an area of more than 4,000 square miles centered in the forest-steppe belt running from Khmel'nitskiy in the west to Sumy and Kharkov in the east. The crop is most extensive in the Vinnitskaya and Cherkasskaya oblasts, but also occupies large parts of the Khmel'nitskaya, Kirovogradskaya, Poltavskaya, and Sumskaya oblasts. Sunflowers lie further to the south in the steppe zone where they are concentrated in the Voroshilovgradskaya, Odesskaya and Nikolayevskaya oblasts. They are cultivated on an area of 3,600 square miles. During June and July they provide concealment possibilities, but the possibilities are limited inasmuch as the sunflowers are interspersed with grain crops, seldom occupying more than eight per cent of the cultivated area.

## b. Pastureland

Apart from cultivation, the most important use to which the land is put is pasture for livestock and hayfields. For the Ukraine as a whole, approximately 15 per cent of the total area is grazing land. The type of pasture varies widely from one district to another.

(1) In the south, in the dry steppes of the Black Sea Lowland and the North Crimea, pastureland is found wherever moisture is insufficient or the soil too sandy to support crops. Vegetation consists of sparse grasses

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and xerophytic shrubs, and the livestock are chiefly herds of sheep and goats which graze widely. In the Crimea nearly a quarter of the land is used for such grazing, while in the Odesskaya, Nikolayevskaya, Khersonskaya, and Zaporozhskaya oblasts the figure is about 20 per cent.

(2) Along the mountain slopes and summits of the Crimean and Carpathian Mountains are found natural meadows where livestock, chiefly cattle, sheep, and goats, are grazed. The meadows are small patches interspersed in moist areas among the woods or are broader stretches covering the summits and slopes above the tree line. In the latter case grazing is seasonal with herds pasturing in the summer months and being moved to protected valleys during the winter. In the Zakarpatskaya oblast nearly a quarter of the land is mountain pasture while in the Drobychskaya and Stanislavskaya oblasts meadows occupy about ten per cent.

(3) In Poles'ye pasture consists chiefly of small hayfields and patches of marsh grass bounded by swamps and woods. The principal livestock is cattle, with dairy herds predominating. In some instances the pasture is untended, and livestock graze widely through the marshes; in other cases the meadows are carefully maintained. In the Volynskaya and Rovenskaya oblasts, these pastures occupy over 25 per cent of the land. In the Zhitomirskaya, Kiyevskaya, and Chernigovskaya oblasts, they total ten to fifteen per cent.

(4) The most extensive form of pastureland in the Ukraine consists of innumerable small plots set aside by the collective and state farms in otherwise cultivated areas for their small herds of dairy cattle or other livestock. The plots are never large and lie generally along river courses or on hill slopes surrounded by open cultivated fields. In the past the plots were gradually being cut away as cultivated areas were expanded; however, in recent years Soviet policy has required the Ukrainian farms to increase their livestock herds and there has been a consequent increase in pasture area. In 1955 the per cent of grazing land varied from a high of 25 per cent in the Voroshilovgradskaya oblast to a low of six per

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cent in the Ternopol'skaya oblast.

c. Forested Land

Only 11 per cent of the total area of the Ukraine is under forests, and their distribution is very uneven. In Poles'ye and in the mountain areas woods cover more than 40 per cent of the surface; in the Zakarpatskaya oblast the figure is 44 per cent. In the steppes to the south, woods disappear almost completely; in the Zaporozhskaya and Nikolayevskaya oblasts they cover only one per cent of the land. In the period after World War II a program for constructing forest shelter-belts in the steppes was inaugurated, but the program has moved slowly, and by 1955 less than 1,000 square miles of woods were planted. Throughout the Ukraine forests are carefully preserved except in Poles'ye and the mountain regions where there is lumbering. In only a few isolated places are the woods unexploited.

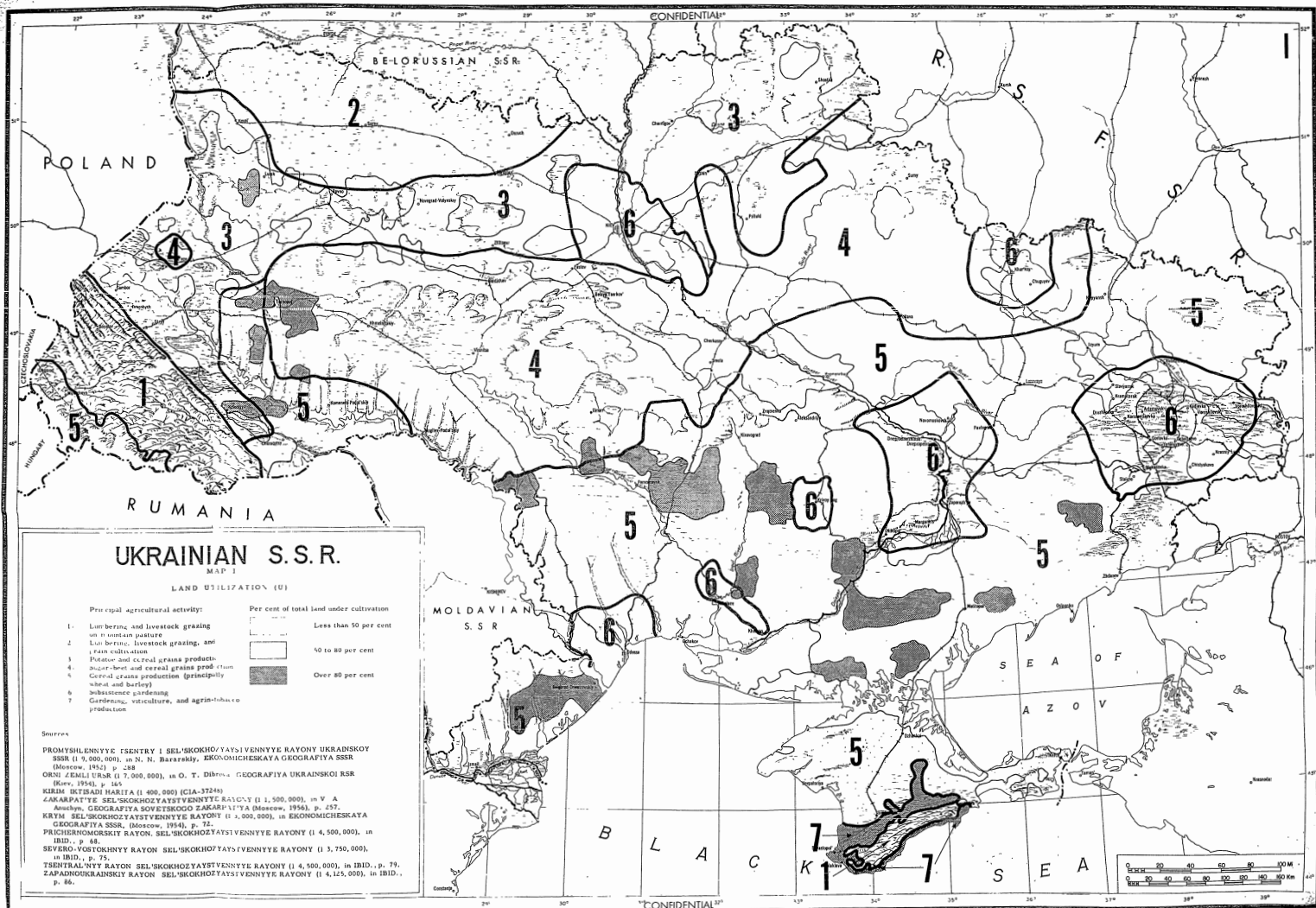
d. Non-Agricultural and Unused Land

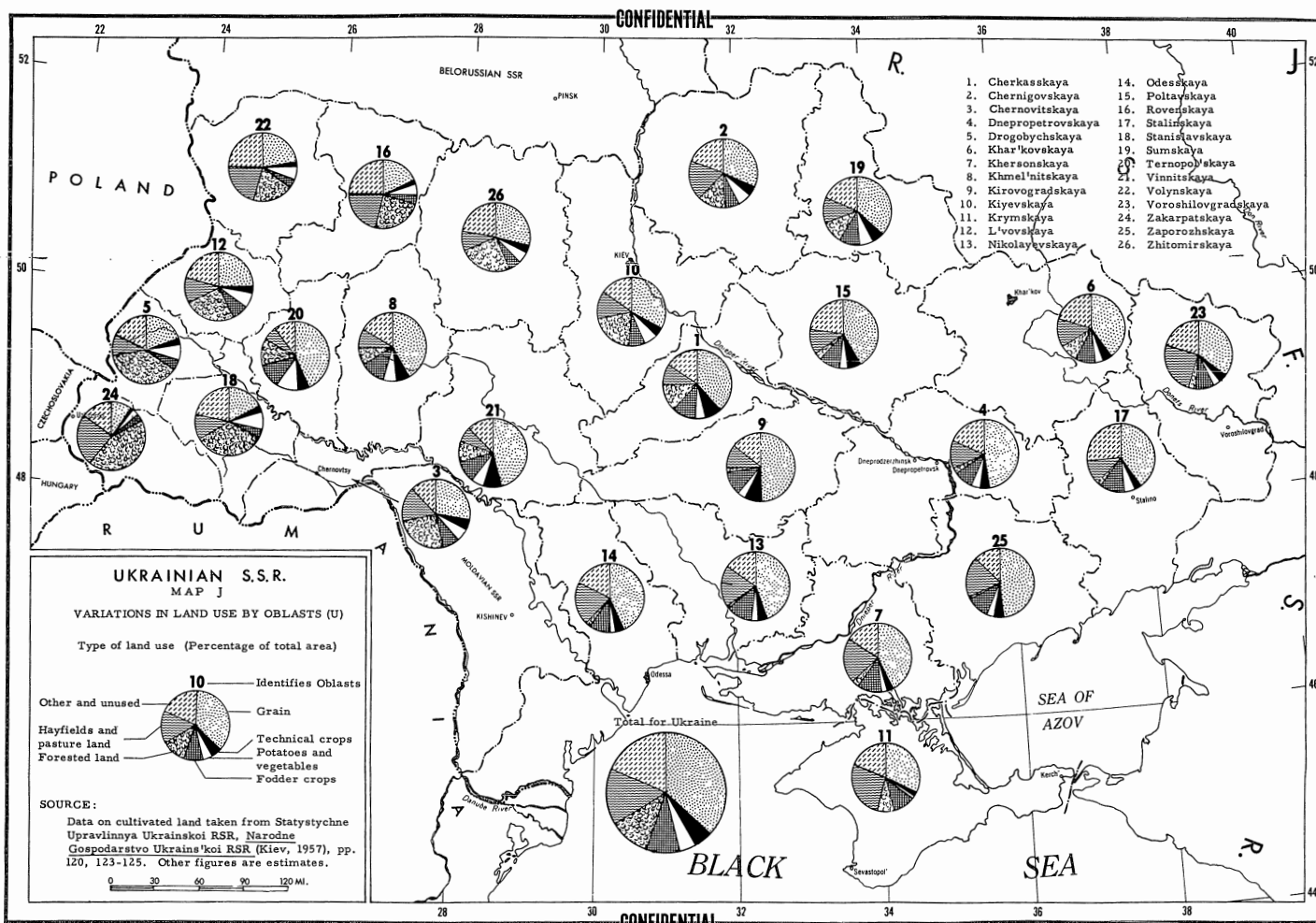
A large part of the Ukraine--19 per cent--is devoted to non-agricultural purposes or is unused. In the Donbass, important stretches are devoted to mining, or are occupied by urban or industrial centers which in some cases adjoin one another forming metropolitan complexes. Similar, although smaller centers are found also in the region of the Dnieper Bend, at Krivoy Rog, Nikopol', and on the Kerch' Peninsula. Extensive urban areas exist at Khar'kov, Kiev, and Odessa. In the Carpathian Mountains there are small and widely scattered oil and gas fields.

Unused land is concentrated at two places. In Poles'ye there are extensive swamps and marshes which are not suitable for cultivation or pasturing. Both before and after World War II reclamation programs were in progress aimed at draining the swamps and putting the land under cultivation, but the extent of the programs so far completed has been small, and vast swamplands remain. In the Volynskaya and Rovenskaya oblasts the swamplands include nearly a quarter of the total area. In the southern districts of the Ukraine and especially in the northern steppes of the Crimea a second form of unused land is found in the extensive stretches of salt flats and sand deserts

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which are too dry or infertile to support even limited pasturing. After World War II a project was inaugurated to irrigate these districts. A South Ukrainian-North Crimean Canal was planned to extend nearly 350 miles from the Dnieper River at Zaporozh'ye to Kerch' on the eastern end of the Crimean Peninsula. The canal is now under construction, and when completed is to irrigate nearly 6,000 square miles of the Krymskaya, Khersonskaya and Nikolayevskaya oblasts. Much of the waste land and grazing fields in these oblasts will then be placed under cultivation.





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7. Patterns of Rural Settlement (See Maps K and L)

## a. Types of Rural Settlement

The types of population settlement in different sections of the Ukraine vary widely from one another. In the flat steppes in the southern Ukraine there are large villages extending for many miles along river valleys. In the mountains there are small settlements or clusters of several households dotted here and there on the sheltered slopes of mountain basins or along mountain streams. In Poles'ye the villages are small and crude and are stretched along the relatively dry banks of the area's sluggish streams or on islands of dry ground surrounded by swamps and marshes.

The most prevalent form of settlement is found in the steppe and forest-steppe districts, and especially in the broad, middle belt of the Ukraine which extends from the eastern to the western borders between Poles'ye in the north and the Black Sea Lowland to the south. To a greater degree than in other areas of the Ukraine, settlement is concentrated in moderately large rural villages varying in size from 500 to 3,000 inhabitants. Villages are found most often along rivers, where they extend in thin lines for distances of several miles along one or both river banks. Where settlement is heaviest, as in the Volyno-Podol'skaya Upland and the northeast Ukraine, the villages form almost continuous ribbons of settlement along the valleys. Away from the rivers, villages have grown up also wherever natural or artificial ponds are found. In contrast to the river settlements, the pond villages are nucleated. In both types of villages houses and farm buildings are constructed usually of sun-dried brick or clay mixed with straw, and are frequently white-washed. Traditionally roofs have been thatched and steeply pitched. Newly-built homes are sometimes of frame construction with tile roofs. A large part of the farming in this area is intensive, and principal crops are sugar beets, potatoes, and fodder-crops. As a result, villages are relatively closely spaced, and farmers travel only short distances to their fields.

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In the southern steppes, especially in the Black Sea lowland and the northern sections of the Crimea, the pattern of population settlement is somewhat different. The principal crops here are wheat, barley, and corn, and cultivation is extensive rather than intensive. The climate is dry, and there are few rivers or streams; as a result the problem of water supply is a difficult one and villages are consequently concentrated almost exclusively along the bigger rivers and streams. The water divide stretches are covered with fertile loess soils 65 to 100 feet deep, and water is available only at considerable distances below the surface. Only in those few places where artesian wells can be dug have suitable sites for villages been found. In general, the water divide areas are without settlement. Agriculture in the southern steppes is more heavily mechanized than in any other part of the Soviet Union. It was here that the first machine tractor station was formed and there is now almost no farming which is unmechanized. In parts of the steppes the machinery is electrified, drawing its power from the great hydroelectric projects on the Dnieper River. Because villages are concentrated along river valleys they frequently adjoin one another closely and contain as many as 3,000 to 5,000 inhabitants. Houses are typically of brick or clay with tile roofs.

A third type of settlement is found to the north in Poles'ye, where the land is distinguished by its numerous swamps and forests. Population in Poles'ye is generally sparse and is settled principally in farm villages located on the higher lands surrounding the swamps. In some cases the villages are built along river banks which are raised above the swampland and hence are relatively dry. In most cases the villages consist of 20 to 100 farmhouses strung along both sides of a single street. In contrast to the steppe villages, houses and farm buildings are principally of wood mounted by thatched roofs. Frequently the houses together with their stables and outlying buildings are grouped to form a courtyard. The land cultivated from the villages consists of small separate plots which are seldom far away. The plots are intensively farmed, with vegetables and cereal grains predominating. The villages are the most backward in the Ukraine, and sanitary and

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water-supply facilities are primitive. In the deepest parts of the swamps, occasional separate dwellings are found, used by trappers and fishermen or by farmers grazing livestock or cultivating tiny patches of dry land.

In the mountain districts of the Ukraine--the Crimean and Carpathian Mountains--the settlement patterns are diverse. In the foothills and in the lower reaches of stream valleys communities similar to those of the steppes are to be found. A typical community consists of 800 to 1,000 inhabitants engaged in agriculture and lumbering. In addition to crops such as wheat and potatoes, orchards, gardens and, in the Crimea, vineyards are cultivated, and livestock are grazed on the steeper slopes. Houses are chiefly of brick with tile roofs.

In the Carpathian Mountains above the foothills, settlements are generally found only in valley basins, along gentle mountain slopes, or along the larger river valleys. Settlements consist usually of a few houses widely separated from one another. The houses are made of wood with high thatched roofs. In the Eastern Carpathians the number of such small villages is very great: in one district in the Zakarpatskaya oblast there are over 5,000, indicating an average density of nearly six villages per square mile. Since 1945 pressure was brought to bear to induce the farmers to join collectives, and in the following years a number of the smaller villages were combined into larger towns with schools, hospitals, libraries, etc. However, many older villages remain, particularly in the higher mountain regions where lumbering is the principal activity.

In the Crimean Mountains the settlement pattern is marked by the numerous resort and health facilities which dot the hills above the Black Sea. In the valleys and mountain basins gardens, vineyards, and tobacco plantations are found, adjoining closely to small villages constructed along mountain streams. At higher elevations there are virtually no permanently inhabited points, although shelters used in the summer months by herdsmen, hunters and lumbermen are to be found.

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## b. Density of Rural Population

Total population density in the Ukraine is indicated on Map K, and rural population density by oblasts on Map L. The most densely populated sections are those in the forest-steppe belt, including the Volyno-Podol'skaya Upland, the Dnieper River districts between Kiev and Kremenchug, and the Poltavskaya and Sumskaya oblasts in the northeastern Ukraine. This is the belt which encompasses the traditionally Ukrainian lands and in which cultivation is of an intensive type. Consequently rural population is dense, varying from 112 to 181 per square mile. Within the belt the most densely settled points are found in the Ternopol'skaya and Vinnitskaya oblasts, where the land is fertile and heavily cultivated.

A second densely populated section is the Chernovitskaya oblast, which occupies a part of the southern valley of the Dniester River, the upper valley of the Prut River, and the eastern section of the Ukrainian Carpathian Mountains. Rural population density is 188 per square mile. Settlements are found not only along the principal rivers, but also in mountain valleys and on mountain slopes extending upward to elevations of 2,000 feet. The dense rural population is engaged in the cultivation of grains, potatoes, and sugar beets, and in the grazing of livestock. At elevations above 2,000 feet settlements gradually disappear, although herdsmen and woodsmen are to be found at heights of 5,000 feet and more.

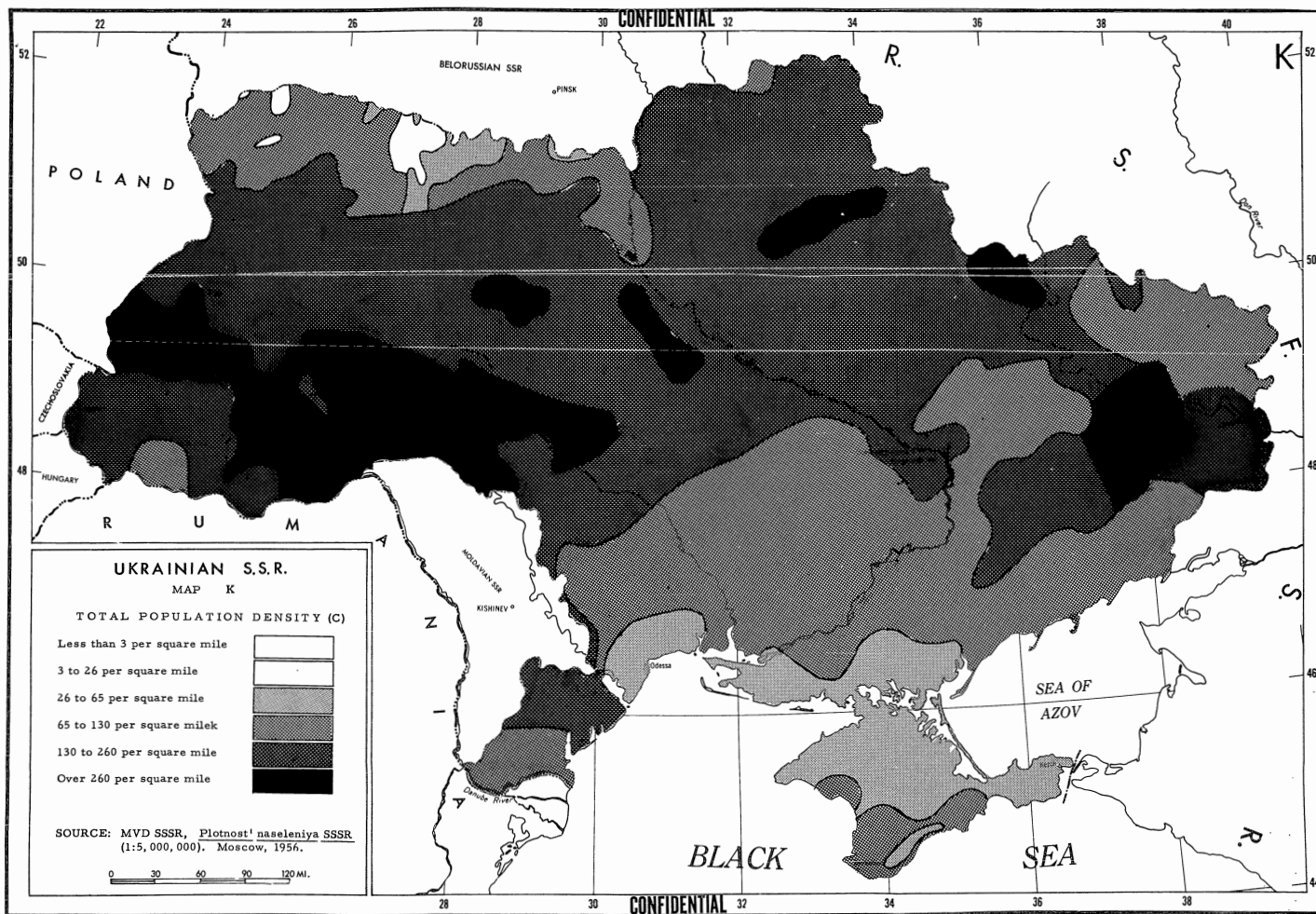
A third densely populated region is the Trans-Carpathian Plain. The most densely settled places are found in the foothills above the plain, especially in the Tisa valley near Tyachev and near the towns of Mukachevo, Vinogradov, Beregovo, and Uzhgorod. Rural population densities in excess of 500 per square mile are recorded at some points. Further into the mountains the population becomes sparse, and settlement is confined almost exclusively to the basins of a few larger rivers. In the mountain meadows and in the forest districts only occasional herdsmen and woodsmen are found.

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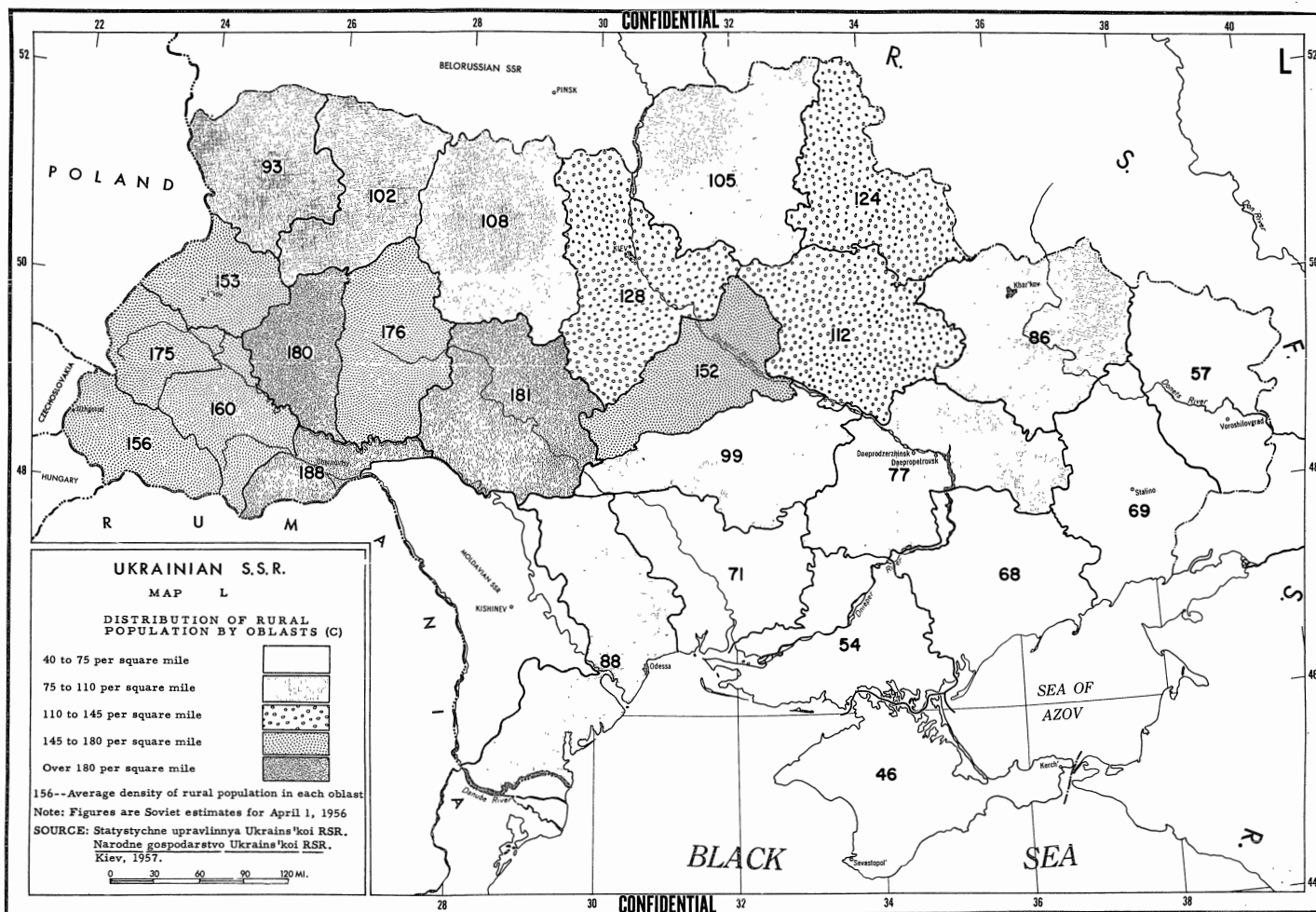
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The sections of the Ukraine with lowest rural population densities are found in the Black Sea Lowland, the Crimean Steppe, and the Donbass. Densities vary from 46 per square mile in the Crimea to 88 per square mile in the Odesskaya oblast. Farming in these sections is extensive, farm machinery is heavily used, and there is a consequent low ratio of farm workers per square mile of cultivated land. In the Donbass the population is predominantly urban, and rural inhabitants are found only in clusters of farm villages producing chiefly vegetables and dairy products for the industrial centers.

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8. Rural Roads

Current information on the density of rural roads in the Ukraine is not available. Rural roads known to have been in use in recent years are plotted on the AMS N501 Map Series. The maps covering the Special Forces suitability areas included in this study present a general picture of the rural road network in these areas.

The most dense network of roads is found in the forest-steppe belt where rural population density is also greatest. Roads are most numerous in the western and eastern sections of the belt and somewhat more sparse in the central districts. Equally numerous roads are to be found in some sections of Poles'ye to the north, and in certain districts of both the Carpathian and Crimean Mountains. Rural roads are relatively sparse in the broad steppe regions in the Black Sea Lowland, in some parts of the Donbass, and in the dry steppes of northern Crimea.

Rural roads everywhere are poor by U.S. standards. In most cases, they do not have a consolidated roadbed and are simply natural roadways connecting one village with another. In the steppe regions where the terrain is level and unbroken the roads are very wide, and during dry weather in the summer and when frozen in the winter are capable of bearing heavy traffic. In wet seasons and particularly during spring thaws the roads become so muddy that they are impassable even for moderate traffic. Light carts and trucks which must travel during these seasons avoid the roads, traveling across the dryer and more passable fields on either side.

In the area of Poles'ye roads are narrow, commonly following thin belts of dry ground between swampy depressions on either side. Possibilities for movement along the swamp roads are excellent only in mid-winter when the ground is frozen. At other seasons the roads are at times locally impassable and in the spring are everywhere closed to all but foot traffic.

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In the mountain regions the standards of rural roads are generally higher and although they are often winding and narrow are open to traffic for larger parts of the year. Both the Carpathian and Crimean Mountains are crossed by numerous trails and tourist routes as well as by roads suitable for light vehicles. In mid-winter roads are frequently closed by snow at elevations of 5,000 feet and above.

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B. Distribution of Partisan Activities, World War II (See Map M)

An important criterion in the selection of suitability areas for Special Forces operations in the Ukraine must be seen in the locational factors defining the operations of the partisan bands which controlled sections of the Ukraine for varying periods in World War II. These factors are of interest to Special Forces planning first because they point to those areas where geographic conditions--terrain, vegetation cover, settlement patterns, etc.--are most favorable for operations by opposition bands, and secondly because they throw light on certain problems Special Forces units operating in the same areas would encounter.

Two principal groups conducted partisan operations in the Ukraine during World War II. The larger group was composed of pro-Soviet partisans organized in most cases by Russian military leaders, led by dedicated members of the Communist Party or by Army or MVD leaders parachuted into the Ukraine, and supplied in part at least by stores of equipment left hidden by the retreating Soviet Army or by material parachuted from Soviet planes.<sup>2</sup> Members of the pro-Soviet partisan groups were recruited in some instances from the local population generally; but apparently the majority of the partisans were Communist Party members, members of partisan battalions specially trained in the rear of the Red Army and sent to favorable areas as the Germans advanced into them, or soldiers of the Red Army who had been surrounded by German forces and had joined partisan bands rather than surrender. Undoubtedly the harshness of the German occupation encouraged some Ukrainians to resist, but it would be misleading to assume that large numbers of the partisans were local inhabitants who had fled to the woods to escape repressive measures.

The second important group of partisans consisted of anti-Soviet bands. These partisans were Ukrainian nationalists who initially viewed the Germans as liberators from the Soviet yoke and were given tacit permission by the German Army to occupy parts of the northwestern Ukraine. During the early months of the war much of their energy was devoted to fighting the Poles in

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the area who were their bitterest enemy.<sup>3</sup> Later the groups were alienated by the harshness of the German occupation, and when ordered by German Army leaders to disband in 1943, they refused, continuing their operations against Soviet and German forces alike. Initially, many members of these bands were emigres who had come into the Ukraine on the heels of the German Army from the eastern districts of Poland. During the later years of the occupation, however, as German repressive measures increased, many local inhabitants fled to the wooded areas of Poles'ye, joining the nationalist groups there. In contrast to the Soviet partisans, the nationalists could rely on no outside group to provide them with supplies. In numerous instances, however, the local population provided them with food and shelter; for equipment and weapons they were forced to depend on whatever they could seize from the Germans or occasionally from pro-Soviet partisan groups.

There were five regions of the Ukraine in which the partisans were strong enough to disrupt German control for long periods of time in at least the outlying areas. In addition, there were seven smaller centers in which partisan groups operated for short periods although they were eventually destroyed by German forces. These general centers of partisan activity have been plotted on Map M. Throughout the rest of the Ukraine there were occasional acts of sabotage which the Germans sometimes labeled as partisan activity, as well as occasional raids by partisan bands. None of these incidents were important in comparison with the activity of the partisan-infested areas.

Poles'ye: -- The largest and most important area of partisan activity was Poles'ye--the wide swamp-forest belt stretching along the northern boundary of the Ukraine (area A on Map M). The area was the most favorable section of the Ukraine for partisan operations. It offered excellent sanctuary for partisan groups because of its moderately heavy forest cover and extensive swamps and marshes, and because its sparse communications network limited possibilities for German counter-measures. The bands operating in the area

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were pro-Soviet bands and were consequently strengthened by their proximity to the marshland in Belorussia to the north where the largest and most important of the partisan groups in the Soviet Union were to be found. In the parts of Poles'ye east of the Dnieper River the people were apparently sympathetic to the Soviet partisans or at least benevolently neutral, and consequently provided them with supplies. In the districts west of the river the people were less sympathetic and provided less support; but because population density was moderately low, the partisans could carry on operations with little fear of detection.

Because of the favorable conditions in Poles'ye partisan groups were both more numerous and more strongly entrenched than in any other region of the Ukraine. Altogether there were perhaps 20,000 men included in the bands, controlling not only the areas outside the cities, but occasionally raiding German centers such as Chernigov and Glukhov.<sup>4</sup> Initially, the partisans were strongest in the region east of the Dnieper River, but early in 1943 a large group commanded by Sidor Kovpak crossed into western Poles'ye;<sup>5</sup> in the following months many other bands developed until almost the entire northern border of the Ukraine came under partisan control. German forces were never able to challenge seriously these forces.

Southern Volynia: -- A second area in which partisans were entrenched during an important part of the war was the area immediately to the south and west of Poles'ye (area B on Map M). Included in the area were parts of the Poles'ye Lowland with its forests and marshlands and also the northwestern sections of the Volyno-Podol'skaya Upland. Before World War II the area had belonged to Poland, and anti-Soviet, Ukrainian nationalist organizations had developed within it. With the German occupation of the region, these organizations had established active, military units which fought at first against the Soviet partisans to the northeast and later also against the German Army. The partisans were strongly supported

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by the sparse population of the area, and remained in control until 1944 and 1945 when the Soviet Army forced them to disband or withdraw further west.<sup>6</sup> Although the geography of the area is not as favorable for Special Forces as are the more northern parts of Poles'ye, there is sufficient cover to provide concealment for large groups, and the population is apparently more sympathetic to anti-Soviet forces than in Poles'ye itself.

Carpathian Mountains: -- The third important partisan area was the Carpathian Mountain region and especially its western, formerly Polish sections (area C on Map M). Since this area was the furthest west of the partisan areas and had not been a part of the Ukraine before World War II, it was the last area in which partisan groups were organized.<sup>7</sup> Like the partisan area immediately to the northeast, it had been a center of anti-Russian, Ukrainian nationalists before World War II, and consequently the bands which appeared were anti-Soviet. In some cases they were composed of Ukrainian partisans who had been forced out of Poles'ye by Soviet partisans and Soviet troops and had taken shelter in the more protected and remote regions of the Carpathians. Toward the end of 1943 Sidor Kovpak led his band of Soviet partisans into the area, but the population was apparently strongly anti-Soviet and the band could not obtain supplies and equipment. The group quickly disintegrated and although other Soviet groups occasionally raided the area, they too were unable to establish bases there, and the area remained into the post-war period a center of Ukrainian nationalist partisans. Possibilities for concealment in the mountains are good, although there are places which are not heavily forested and which are moderately densely settled with numerous access roads and communications lines. On the basis of World War II experience it would be expected that Special Forces would be more strongly supported in the Carpathian Mountains than in any other section of the Ukraine.

Crimean Mountains: -- The fourth partisan center was the Crimean Mountain region on the southern coast of the Crimean Peninsula (area D on Map M). Numerous pro-Russian, anti-German encampments were established in the forested

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parts of the mountains and perhaps as many as 10,000 partisans were active at various times.<sup>8</sup> The partisans were under the same form of organization as were those in Poles'ye, and came under the close control and guidance of the Central Staff of the Partisan Movement of the Red Army. The groups were strongest at the end of 1942, and although the Germans were later able to make extensive raids against them, they were never completely eliminated before German troops were forced to withdraw in 1944. The area is less isolated than the Carpathian Mountains or Poles'ye, being crossed by a number of paved roads and dotted with tourist centers and trails. Its population would probably be unsympathetic to American Special Forces, for the only group which opposed the Russian partisans in World War II--the Crimean Tatars--were subsequently deported to Central Asia.

Dnieper River between Cherkassy and Kiev: -- The last important center of partisan activity was the area between Cherkassy and Kiev along the Dnieper River (area E on Map M). The partisans operating in the area were pro-Russian partisans numbering approximately 2,000 at their greatest strength.<sup>9</sup> Except for the Black Forest, southwest of Cherkassy, tree cover is limited, being confined to the shores of the Dnieper River and its tributaries. Apparently the ability of the World War II partisans to maintain themselves rested more on their proximity to the stronger partisan groups in the northern Ukraine and on German reluctance to commit the troops necessary to destroy them rather than on the geographic features of the area. Only small Special Forces groups could find shelter in the Black Forest, and the area as a whole does not compare in suitability for unconventional warfare operations with the other four areas of heavy partisan activity.

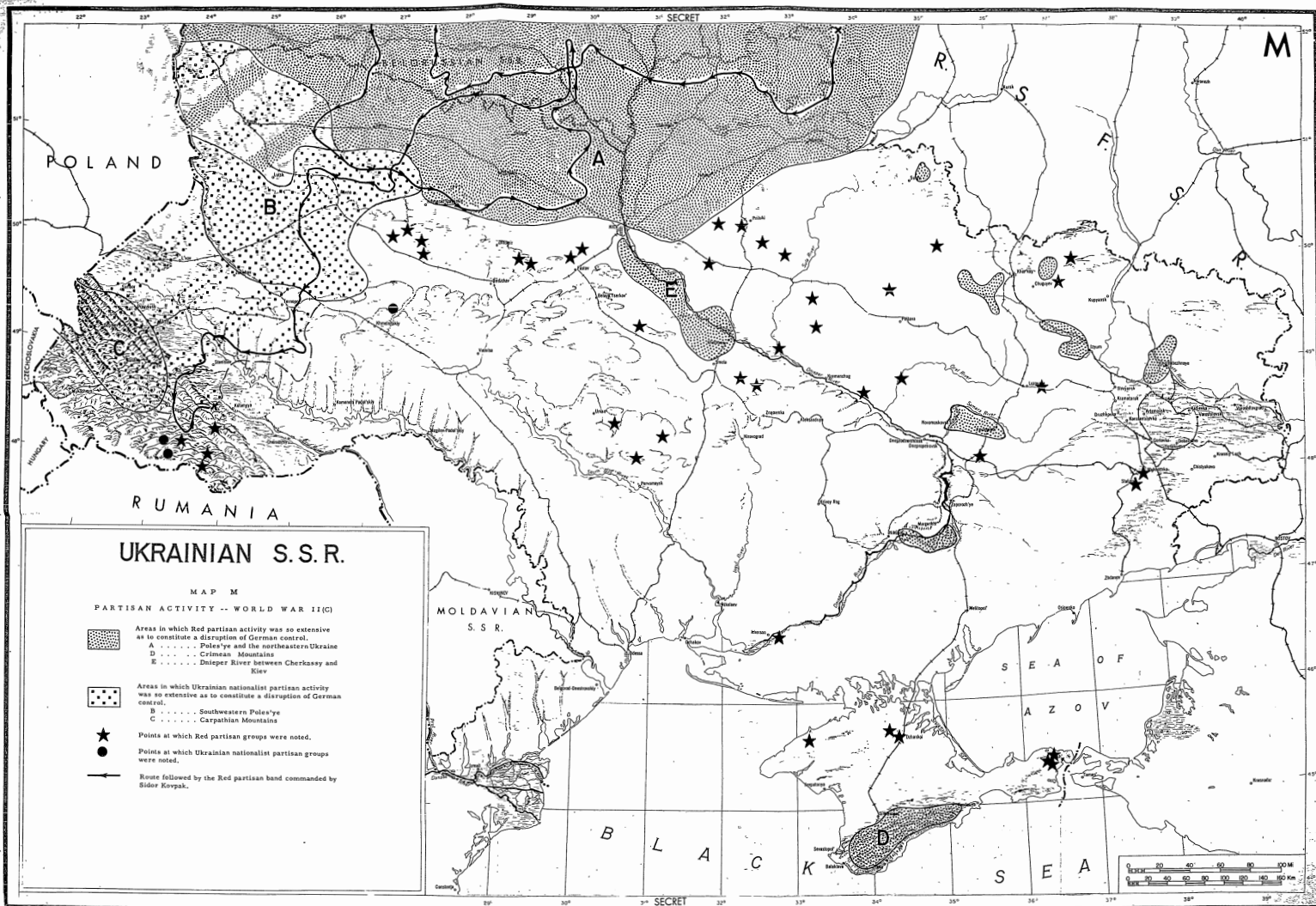
The seven smaller centers in which partisan groups operated for short periods of time were of less importance. None were controlled by partisans for more than four months, and the bands were able to remain as long as they did only because German forces were not immediately available and organized to operate against them. The band of 350 men in

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the swamps near Nikopol' was dispersed within a month of the time it was organized;<sup>10</sup> the groups located along the Donets River and east of Sumy were quickly destroyed; many of the Kharkov partisans were dispersed by local inhabitants hostile to the Soviet regime even before the German Army took steps against them. The only area in which the partisans were not easily uprooted was the forested section lying in the bend of the Samara River between Novomoskovsk and Pavlograd. Here approximately 350 partisans were able to maintain themselves from October 1941 to January 1942. As in the case of the partisans around Cherkassy, however, they were not immediately destroyed chiefly because the situation on the front lines prevented the Germans from assigning the necessary troops to the area to oppose them. In January, a German Infantry Regiment arrived in Novomoskovsk and in a brief engagement completely wiped them out.<sup>11</sup>

On the basis of the experience of the partisans in the seven smaller areas of activity in the Ukraine, it is apparent that the areas provide suitable shelter only for small Special Forces operations and only for short periods before Soviet forces are directed against them. The forest zones are small in area--less than 200 square miles--and are separated from one another and from the larger wooded regions by broad stretches of coverless steppe. Communications facilities near the areas are good, and Soviet troops could be moved quickly to surround the woods. Unconventional warfare operations, limited in size and scope and particularly in the time needed to accomplish their missions, could be carried out in the areas; but no large-scale operations as in the north and west Ukraine and the Crimean Mountains are feasible.

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C. Distribution of Resistance Incidents, 1945-1957 (See Map N)

The resistance incidents reported since World War II and described in Appendix I have been plotted on Map N. The striking feature of the distribution of the incidents is their heavy concentration in the westernmost, formerly Polish parts of the Ukraine. Of the 212 recorded incidents, 163--nearly 77 per cent--have taken place in the six oblasts (Rovenskaya, Volynskaya, L'vovskaya, Ternopolskaya, Stanislavskaya, and Drobychskaya) transferred from Poland to the Soviet Union during World War II. Twenty-one of the remaining 49 incidents have occurred also in the westernmost parts of the Ukraine, but in the areas ceded to the Soviet Union by Czechoslovakia and Rumania (the Zakarpatskaya and Chernovitskaya oblasts). In the other sections of the Ukraine--the districts belonging to the Soviet Union before World War II--only 28 incidents, approximately 13 per cent of the total, have been reported in the post-war years. The predominance of the formerly Polish areas as centers of resistance has not been quite as prominent as the tabulation in Appendix I indicates because the insurgents operating in these sections have had close connections with emigre nationalists in the Western world and hence have reported more completely and directly on their activities than have resistance groups in other sections of the Ukraine. Undoubtedly many acts of resistance carried out in the eastern Ukraine have never been reported outside the Soviet Union. Nevertheless, with due allowance for the more complete reporting of resistance in the western Ukraine, there is little question that a preponderant part of opposition to the regime has been expressed here, and that it has been expressed in a more active form than elsewhere.

The concentration of resistance may be explained in two ways. First, the Ukrainian population in the six western oblasts has been consistently the most strongly opposed of Ukrainian groups to Soviet rule. In the period between the first and second world wars the area,



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as a part of Poland, became a center for anti-Soviet Ukrainian nationalists. Many Ukrainians inside the Soviet Union unwilling to accept the Soviet regime fled to the area, joining there in the organization of strongly anti-Russian, Ukrainian groups. The Polish government provided some encouragement for their efforts. As a result, when the Soviet Union seized the area at the beginning of World War II, it incorporated within the Ukraine an organized and strongly anti-Russian group. Following the war, the hostility of the local population was intensified because the process of Sovietization of the new districts was carried out at a pace which far exceeded that by which the Soviet Union itself had been initially socialized as well as the pace being followed by the satellites in their program of socialization. Industries were immediately taken over by the state; farm collectivization was speedily pressed; severe quotas for food deliveries and work-norms were established and enforced. As a result, Ukrainian opposition to Soviet rule in the western districts, and especially among the farmers, increased rapidly.

The second explanation for the concentration of resistance lies in the geography of the western parts of the Ukraine. Included within the area are parts of three physiographic regions, all of which provide at least moderately favorable conditions for the survival of resistance groups. In the north, the Volynskaya and Rovenskaya oblasts are covered by the Poles'ye swamps where evasion possibilities are excellent: forests in the oblasts are relatively dense, providing suitable concealment for resistance bands; population density is not high, enabling bands to escape detection; the ground is marshy in most places, providing an important obstacle to Soviet security forces moving against the insurgents. In the center of the western sections of the Ukraine, the Volyno-Podol'skaya Upland extends into the two oblasts of L'vovskaya and Ternopolskaya: the upland offers less favorable conditions for evasion, but wooded sections and numerous deep valleys with wooded slopes provide possibilities for concealment in places. In the south, the Carpathian Mountains and the Carpathian Hills cover large

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parts of the Stanislavskaya and Drobychskaya oblasts: the heavy forests and mountainous terrain found at many points interfere with movement and assist evasion and concealment. These physical factors conspire to render conditions for resistance more favorable than is the case in any other region of the Ukraine.

Within the newly acquired western districts of the Ukraine are seven points at which resistance has been concentrated. The most important has been the triangle identified by the three towns of Stanislav, Slavsko, and Stryy. Within the triangle 61 incidents have been reported--29 per cent of all incidents in the Ukraine. The triangle is centered on the northeast foothills of the central section of the Ukrainian Carpathian Mountains on the border between the Drobych and Stanislav oblasts. Its terrain is dissected, although not as sharply as in the more mountainous regions further to the south. Forest cover is not continuous throughout the triangle, but heavy woods are found especially east of Slavsko and in a line west of Stanislav. The triangle lies on the edge of the line of settlement of the two oblasts; to the south only a few, small and scattered communities are to be found. Access to the triangle is difficult inasmuch as only one highway and rail line are to be found--between Stryy and Stanislav--plus a few secondary roads. The people living in and near the triangle have been strongly anti-Soviet, and although many have been deported to the east and replaced by Ukrainians from more settled and pro-Soviet districts, some anti-Russian nationalists apparently remain.

The second important center of resistance has been the heavily eroded sector of the Volyno-Podol'skaya Upland extending southeastward from L'vov to the Dnestr River. Twenty-nine incidents or 14 per cent of the total for the Ukraine have taken place in the area. Although maximum elevations in the upland are less than 1,400 feet, numerous rivers and streams have cut sharply into its surface forming deep valleys with steep slopes. The valleys themselves are flat and swampy, and the woods which once covered

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them have been cut-over and the land planted to crops. Population density in the valleys is high. On the hills and ridges separating the valleys forests are to be found and there is little settlement. It is here that possibilities for evasion and concealment are good. According to numerous reports the people living in the sector have been strongly opposed to Soviet rule and especially to collectivization. They have provided considerable assistance to the insurgents in the area.

A third important center of resistance has been the western section of the Drogobychskaya oblast between the town of Drogobych and the western frontier of the Ukraine south of the Dnestr River. Seventeen incidents or eight per cent of the total in the Ukraine have been reported here. The terrain is mountainous with elevations of 3,000 feet or more in some places. Southeast of Turka is a heavily forested area, unpopulated except for scattered woodsmen and herdsmen; possibilities for concealment are excellent. Elsewhere heavy woods are found here and there, although they are not continuous. The only communications link is a single-track rail line and a paved highway running from Sambor to Turka and beyond.

Two other important centers of resistance have been reported in the general area of the Carpathian Mountains. In the Eastern Carpathians along the upper reaches of the Prut River ten incidents have been noted. The incidents have been concentrated near the towns of Delyatin and Nadvornaya and along the rail line leading to Kolomyia and southward across the Carpathians toward Rumania. The mountains are rugged and high in this sector and there are no settlements or communications facilities away from the valleys. The second area is centered on the southwestern slopes of the mountains above Uzhgorod in the Zakarpatskaya oblast. Partisans have apparently operated from the Ungdarok Forest--a heavily wooded section to the northeast of Uzhgorod. The partisans have attacked kolkhozes in the vicinity, as well as the highway and rail line between Perechin and Uzhgorod and between Uzhgorod and the Hungarian border.

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Outside the Carpathian Mountain region there have been two additional centers of resistance in the western Ukraine. The first lies in the Poles'ye swamp district east of Rovno where six incidents of resistance have been reported. During and after World War II the area was a center for the Ukrainian Insurgent Army, and throughout the post-war period the local population opposed collectivization and supported groups unfriendly to the regime. The combination of swamps and forests in the vicinity was favorable for insurgents, and numerous underground bunkers were built. After 1950 many of the original inhabitants were deported and replaced by eastern Ukrainians whose loyalty to the regime was more certain. Hence Special Forces could no longer anticipate local support with as great assurance. The second center of resistance has been the area near Ternopol' where five incidents have been reported. Although the terrain is moderately dissected, conditions are generally unfavorable for resistance groups. No incidents have been reported after 1950, suggesting that opposition elements in the local population have been largely eliminated.

Outside the western districts of the Ukraine the only reported resistance activities have been located in the cities. In Kiev nine incidents have been reported, the only important number anywhere in the eastern Ukraine. In Stalino, Kadiyevka, Kharkov, Zaporozh'ye, and Odessa other incidents have been noted, but they have been isolated and have indicated little basic, underlying hostility to the regime. The lack of resistance activities in the populated areas of the Ukraine confirms the suggestion that the cities have been Russified. It is only in the rural western regions where terrain conditions are favorable and the population dissatisfied that resistance has been important.

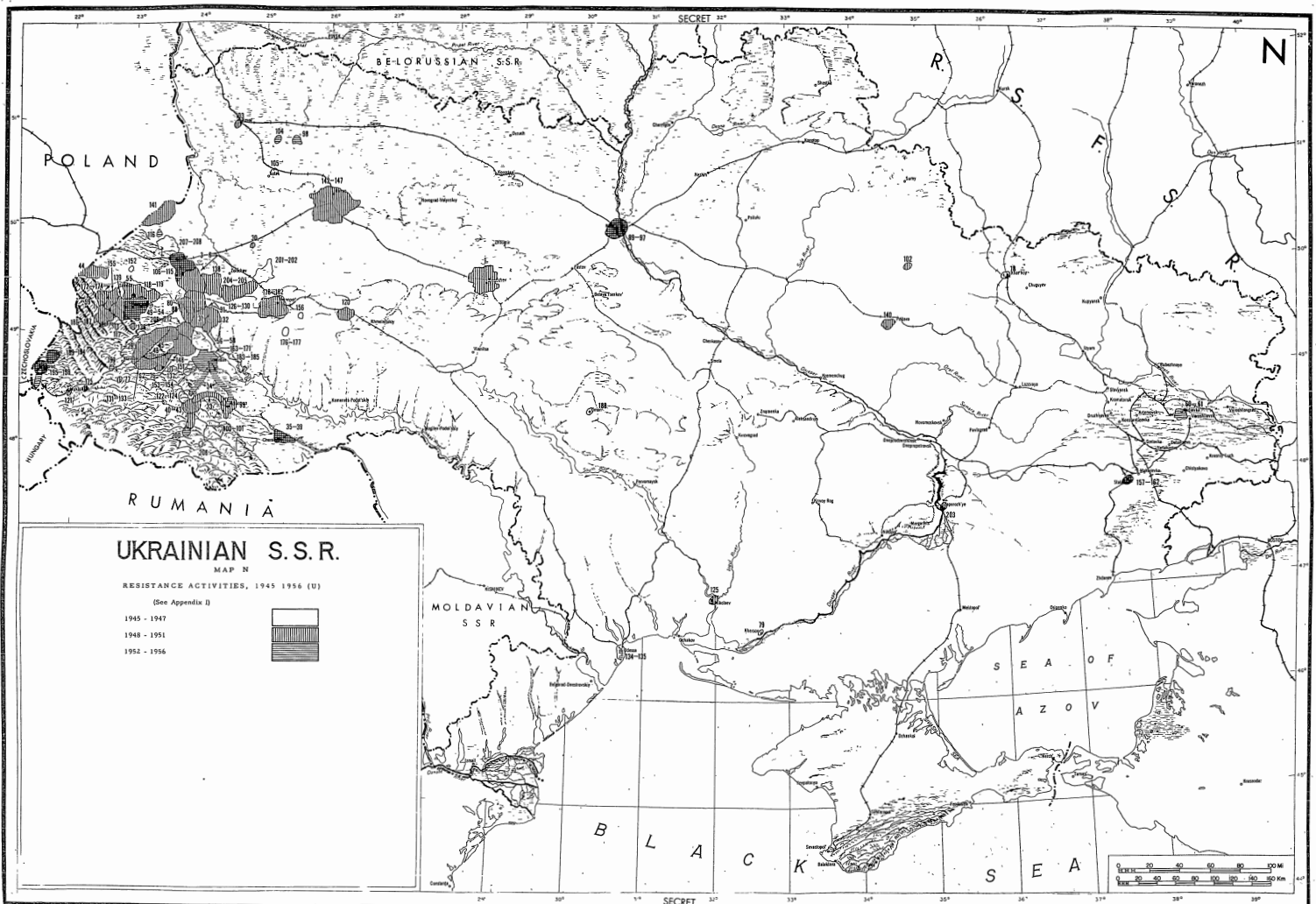
In most recent years resistance has been much less widely distributed than in the immediate post-war period. Incidents have been reported in the cities of Kiev, Stalino, and Kadiyevka, and in the western Ukraine in L'vov, Stanislav, Chernovtsy, and Uzhgorod. Many of the reports have referred to student unrest which was not subversive in itself or to isolated raids which

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may have been carried out by bandits rather than resistance groups. The only areas in which distinctly partisan attacks have been located are in the mountainous areas near Drogobych, south of Stanislav, immediately west of Chernovtsy, and north of Uzhgorod; in the Poles'ye swamps north of Lutsk and east of Kovel'; in the woods near L'vov and Magerov; and in the cities of Kadiyevka and Stalino. Only in the Carpathian Mountains have partisan activities been reported after 1955.

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PART III

POPULATION FACTORS AFFECTING SPECIAL FORCES OPERATIONS

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1. Total Population

The population of the Ukraine on April 1, 1956 was reported by official Soviet figures to be 40,587,000. A breakdown of this total by oblasts with its rural-urban distribution is given in Table IV below. As indicated by

TABLE IV  
POPULATION OF THE UKRAINIAN SSR,  
April 1, 1956\*  
(Figures are in thousands)

Oblast	Urban	Rural	Total
Cherkasskaya	261	1,236	1,497
Chernigovskaya	292	1,276	1,568
Chernovitskaya	186	581	767
Dnepropetrovskaya	1,514	955	2,469
Drogobychskaya	205	648	853
Khar'kovskaya	1,402	1,043	2,445
Khersonskaya	239	568	807
Khmel'nitskaya	211	1,420	1,631
Kirovogradskaya	300	906	1,206
Kiyevskaya	1,261	1,425	2,686
Krymskaya	662	457	1,119
L'vovskaya	521	715	1,236
Nikolayevskaya	316	680	996
Odesskaya	819	1,124	1,943
Poltavskaya	385	1,249	1,634
Rovenskaya	122	799	921
Stalinskaya	3,226	705	3,931
Stanislavskaya	243	857	1,100
Sumskaya	360	1,166	1,526
Ternopol'skaya	124	966	1,090
Vinnitskaya	269	1,874	2,143
Volynskaya	175	715	890
Voroshilovgradskaya	1,633	587	2,220
Zakarpatskaya	217	712	929
Zaporozhskaya	683	710	1,393
Zhitomirskaya	336	1,251	1,587
Ukrainian SSR	15,962	24,625	40,587

\* Source: Statystychne upravlinnya Ukrain's'koi RSR. Narodne gospodarstvo Ukrain's'koi RSR. (Kiev, 1957, pp. 7-8)

the Table there are six principal centers of population: the Donbass (Stalinskaya and Voroshilovgradskaya oblasts), the Dnieper Bend region (Dnepropetrovskaya oblast), the urban areas of Kiev, Kharkov, and Odessa (Kiyevskaya, Khar'kovskaya, and Odesskaya oblasts), and the farming districts around Vinnitsa (Vinnitskaya oblast). With the exception of the Vinnitskaya oblast

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TABLE V  
ETHNIC COMPOSITION OF THE UKRAINIAN SSR  
(Figures are in thousands)

	1926*	1939**	From Po- land, 1939#	To Moldavian SSR, 1940#	Total, 1940##	Total, 1946	Total, 1956 ++
Ukrainians	23,219-80.0%	23,698-76.5%	4,652	80	28,066-73.7%	27,167-78.2%	30,821-75.9%
Russians	2,677- 9.2	4,168-13.4	32	125	4,319-10.9	4,225-12.2	5,974-14.7
Jews	1,578- 5.4	1,553- 5.0	762	225	2,520- 6.4	1,277- 3.7	1,501- 3.7
Poles	476- 1.6	577- 1.2	1,830		2,207- 5.6	975- 2.8	1,090- 2.7
Germans	391- 1.4	450- 1.5	87		557- 1.4	57- .2	67- .2
Moldavians	258- .9	240- .8		220	130- .3	113- .3	123- .3
Greeks	105- .4	116- .4			116- .3	103- .3	115- .3
Belarus .	92- .3	92- .3			152- .4	135- .4	146- .4
Bulgars	76- .3	85- .3	2	60	87- .2	80- .2	90- .2
Turks	22- .1	27- .1		40	60- .2	60- .2	67- .2
Czechs	16- .1	11- .1	31		45- .1	44- .1	49- .1
Gypsies	11- .1	15- .1		10	25- .1	28- .1	29- .1
Armenians	11- .1	15- .1			15- .1	13- .1	14- .1
Rumanians						287- .8	310- .8
Other	115- .5	140- .5	12	10	162- .4	11- .1	15- .1
Total	29,018	30,960	7,408	1,380	39,448	34,725	40,597

\*Official census figures. Nationalities are defined according to ethnic group rather than language or religion.

\*\*Estimates based on 1939 census figures for the USSR as a whole with adjustments for local peculiarities in the Ukraine.

# Official census figures of 1931 adjusted for average rates of growth. Nationalities are defined according to religious affiliation. Border of new territories is that adopted after World War II.

## Estimated. Areas incorporated into the Moldavian SSR are not included.

+ Estimated. Totals include the following wartime changes: liquidation of 1,270,000 Jews; evacuation of 480,000 Germans;

wartime losses of approximately ten per cent for all ethnic groups except the Russian. Totals include the following

post-war changes: incorporation of 483,000 Ukrainians from Poland; repatriation of 800,000 Poles to Poland; incorpora-

tion of Trans-Carpathia with approximately 192,000 Ukrainians, 287,000 Hungarians, and 26,000 others.

++ Estimated. Totals are adjusted for estimated average growth and include the Crimea with approximately 395,000 Ukrain-

ians, 685,000 Russians, 30,000 Jews, and 9,000 others.

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these are all important urban and industrial centers. Principal concentrations of rural population are found in the Vinnitskaya, Kiyevskaya, and Khmel'nitskaya oblasts. Rural populations, however, are significant throughout the Ukraine, while urban concentrations are large only in six oblasts (Dnepropetrovskaya, Khar'kovskaya, Kiyevskaya, Odesskaya, Stalinskaya, and Voroshilovgradskaya).

## 2. Ethnic Composition (See Map O).

Although recent information on ethnic composition is not available, an estimate of the size of the various nationality groups now inhabiting the Ukraine is given in Table V. Four principal groups comprise nearly 97 per cent of the total population--Ukrainian, Russian, Jewish, and Polish. Smaller groups include the Hungarian, occupying part of the Trans-Carpathian Plain; the Bulgarian, scattered in rural settlements in the Black Sea Lowland and in the Izmail region (transferred by Rumania to the Ukraine during World War II); the Moldavian, concentrated near the Moldavian SSR in the Chernovitskaya and Odesskaya oblasts; the Greek, occupying small districts along the Black Sea coast; and the Belorussian, lying along the Ukraine's northern frontier. The numerous German settlements in the Ukraine before 1940 were almost completely evacuated or deported by German or Russian forces during World War II.<sup>1</sup> The Tatars living in the Crimea were somewhat later deported to the Uzbek SSR by the Russian government because of their wartime sympathy for the Germans.<sup>2</sup>

### a. Ukrainians

The largest ethnic group is the Ukrainian which numbers approximately 30,821,000 or nearly 76 per cent of the total. Ukrainians are distributed throughout the entire area of the Ukraine, but their numbers vary from region to region.<sup>3</sup> In general, highest percentages are found in the west and north and lowest percentages in the east and south. Fewest numbers are found in the Crimea, which did not become a part of the Ukrainian SSR until February 1954; for the Crimean Peninsula as a whole only 35 per cent of the population is Ukrainian, and along the

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southern coast and in the Kerch Peninsula the percentage is considerably lower. Outside the Crimea, Ukrainians are also a minority in three regions: along the Black Sea and the Sea of Azov they comprise 40 to 50 per cent of the population;<sup>4</sup> in many sections of the Donbass, they number less than 50 per cent; in the northeastern corner of the Ukraine--in parts of the Sumskaya and Chernigovskaya oblasts--there are districts with a population less than 40 per cent Ukrainian.

The heaviest concentration of Ukrainians is found in the northeast and north-central oblasts of the Ukraine. Around Priluki, Nezhin, and Konotop over 95 per cent of the people are Ukrainian, while in the belt from Sumy and Poltava to Kremenchug and Uman' the average seldom falls below 90 per cent. High proportions of Ukrainians are also found in the central and west oblasts. No reliable estimate of the percentage of Ukrainians living in the various districts of the formerly Polish provinces is possible because no detailed information on the repatriation of Poles is available. However, it seems likely that Ukrainians comprise at least 70 per cent of the total population. They are probably most numerous in the Stanislavskaya, Volynskaya, and Rovenskaya oblasts and least numerous in the Ternopol'skaya and L'vovskaya oblasts.

More important than the regional distribution of Ukrainians is their urban-rural distribution. According to the 1926 census, 89 per cent of the Ukrainians lived in rural areas and only 11 per cent lived in the cities. Ukrainians clearly predominated in the countryside where they made up 87 per cent of the population while in the cities they were a minority--47 per cent.<sup>5</sup> It is probable that the concentration of Ukrainians in the countryside has decreased only slightly since 1926 and that the predominance of the non-Ukrainians in the cities remains. As the cities have become more and more industrialized, Russian specialists and technicians have been drawn to Ukrainian urban regions, while at the same time Ukrainians living in the cities have been Russified at a faster rate than Ukrainians living in rural areas. Hence it seems likely that nearly 80 per cent of the Ukrainians now live in the

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countryside, and that correspondingly less than half of the people living in Ukrainian cities are Ukrainian. This suggestion is confirmed by the information contained in Table VI below, which estimates the ethnic composition of certain, principal, Ukrainian cities. For these cities as a whole, the

TABLE VI  
ETHNIC COMPOSITION OF PRINCIPAL UKRAINIAN CITIES \*

City	Russians	Ukrainians	Jews	Others
Kiev	33%	50%	11%	6%
Kharkov	35	40	20	5
Odessa	50	25	20	5
Stalino	67	25	--	8
Dnepropetrovsk	36	50	9	5
L'vov	58	38	--	4
Zaporozh'ye	28	57	6	9
Makeyevka	75	20	--	5
Voroshilovgrad	55	34	6	5
Krivoy Rog	29	53	10	8
Zhdanov	55	35	--	10
Nikolayev	57	29	11	3
Gorlovka	56	34	--	9
Dneprodzerzhinsk	35	60	--	5
Yenakiyevo	57	32	--	11
Kramatorsk	64	32	2	2

\*Air Research Division, Library of Congress, Target Complex Studies (Washington, D.C., 1949-1951) (s).

Ukrainian population is less than 40 per cent of the total. In smaller towns and in cities where industrial development has been less rapid the percentage is undoubtedly higher, but it seems likely that of the entire urban population Ukrainians are a minority.

The predominance of Ukrainians in the total population as described above is somewhat misleading. In Table V and throughout this discussion national groups are defined as ethnic groups rather than religious or language groups. As a result, no allowance has been made for the gradual drift of Ukrainians and other minorities to the Russian language and to an identification with Russian traditions and Russian authority. That this process of Russification has been an important one is indicated by figures of the 1926 census which noted that over a million Ukrainians--nearly five per cent of the total--considered Russian their primary language.<sup>6</sup> In the years after



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1926 Russification proceeded at a faster rate as numerous Ukrainian peasants were drawn to the rapidly growing industrial cities of the Ukraine where they were subjected to strong Russian influences. It seems likely therefore that five to ten per cent of those now classified as Ukrainians have largely abandoned their language and traditions. For purposes of Special Forces planning the shift is of primary importance, for these Ukrainians are undoubtedly only slightly motivated by nationalist feelings and could be expected to support rather than oppose a Russian-dominated or even the Soviet regime.

## b. Russians

The largest minority group in the Ukraine is the Russian which numbers about 6,000,000 or nearly 15 per cent of the total. Russians are a majority of the population in two regions: in the Crimea where 685,000 Russians constitute more than 60 per cent of the population; in the Donbass where they total more than 50 per cent. They predominate also along the Ukrainian-RSFSR border, notably west of Zhdanov, northeast of Kharkov, and in the northern districts of the Chernigovskaya and Sumskaya oblasts. Smaller but important concentrations are found near Kirovograd and Dnepropetrovsk, and in a belt across the southern part of the Black Sea Lowland.

In contrast to the Ukrainians the Russians are predominantly an urban group. According to the 1926 census 54 per cent lived in the cities and 46 per cent in the countryside. Russians were the largest, single, urban group, comprising nearly 45 per cent of the city population. After 1926 and until the outbreak of World War II Russian predominance in the cities increased as a result of the gradual Russification of other urban elements and as a result of an in-migration of Russians from outside of the Ukraine into its new industrial centers. Although the trend has been countered in part by the rising movement of Ukrainian farmers to the cities, the basic, Russian character of the urban population has not been altered. According to Table VI, 46 per cent of the people living in the sixteen largest cities of the Ukraine are Russians. In the industrial centers in the Donbass the percentages are very

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high: in Makeyevka, 75 per cent of the population is Russian; in Stalino 67 per cent; in Kramatorsk, 64 per cent.

As in all other areas of the Soviet Union, the Russian group enjoys a definitely privileged status in the Ukraine which gives it considerably greater importance than its numbers would warrant. For a brief period in the twenties and early thirties the Russians--as well as other minority groups--were subjected to a Ukrainization policy which restricted the use of the Russian language and encouraged Ukrainians to replace Russian in important administrative policy. With the reversal of the Ukrainization policy in 1932, the Russian group was again given a privileged position. Russian was not only made the official language of schools with a majority of Russian students, but was also made compulsory in all Ukrainian schools. It was provided that Russian would be a second official language for government offices and public services. The principal newspapers in the Ukraine were gradually returned to the Russian language. Russians again were encouraged to occupy the most important government and administrative posts. As a result, the Russians apart from their ethnic ties to the ruling group in the USSR, are undoubtedly more loyal to the Soviet regime than any other nationality in the Ukraine. They can be expected to be in opposition to Special Forces objectives, except in a situation when operations in the Ukraine would coincide with a general internal break-up of the Soviet regime.

## c. Jews

Before World War II the Jews were a second important minority group in the Ukraine. Included in the republic were more than half of the Jews living in the entire USSR. In 1897 they numbered 1,674,000, constituting nearly 8 per cent of the Ukrainian population. However, by 1926 the percentage had fallen to 5.4 and by 1939 to 4.9.<sup>7</sup> At the outbreak of World War II nearly two million additional Jews were incorporated into the Soviet Union--over half of them into the Ukraine; however most of these were annihilated by the Germans when the Nazi armies first invaded the Soviet Union. Other Jews fled or were evacuated from the Ukraine ahead of the German

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occupation and did not return at war's end. Of those remaining in the Ukraine, nearly one million were liquidated by the Germans.<sup>8</sup> As a result, it is estimated that there are now slightly over 1,500,000 Jews in the Ukraine--approximately 3.7 per cent of the total population.

Throughout the Soviet period there has been a steady movement of Jews from the countryside to the village, from the village to the town, and from the town to the city. As a result, the Jewish population has become more urbanized even than the Russian. In 1939, 85 per cent of the Jews lived in the cities and only 15 per cent in the countryside.<sup>9</sup> After the war the urbanization trend continued, and it is likely that 90 per cent of the Jews now live in urban areas. At the same time, the Jews have tended to move to the largest cities in the Ukraine.<sup>10</sup> As shown in Table VI, over a third of the Ukrainian Jews (537,000) live in nine of the Ukraine's sixteen largest cities. In Kharkov and Odessa they comprise 20 per cent of the population. Before the war the Jews played an important role in the life of the cities, but there are indications that after the war their importance diminished.

Regionally, the Jews were most strongly concentrated before the war in the cities on the Black Sea, in the western Ukraine, and in the urban areas of the right-bank, steppe region of the Ukraine from Kiev southwest through Berdichev, Khmel'nitskiy, and Vinnytsa. As a result of the war, the Jews in the western districts were almost completely removed or destroyed. The largest Jewish groups now remaining are in the cities of Odessa, Kharkov, Kiev, Dnepropetrovsk, and Krivoy Rog.

Because the Ukrainian Jews are so remarkably an urban group, they have come strongly under Russian influence. Almost half of them have adopted the Russian language, and many have become loyal members of the Communist Party. Soviet leaders on their part have encouraged Jewish support by adopting a strong attitude of hostility toward the anti-Semitism which has traditionally been so important in the Ukraine. In the last years of Stalin's rule it appeared that the Soviet policy encouraging the Jews had been reversed.

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However, following Stalin's death the anti-Jewish measures he had adopted were repealed, and it seems likely that the Jews in the future will remain generally sympathetic to the Soviet regime. In the Ukraine where the Jews and Ukrainians have been such bitter enemies it would be expected that the Jews would be hostile toward any activities by Special Forces which, directly or indirectly strengthen Ukrainian nationalism or pave the way for state autonomy.

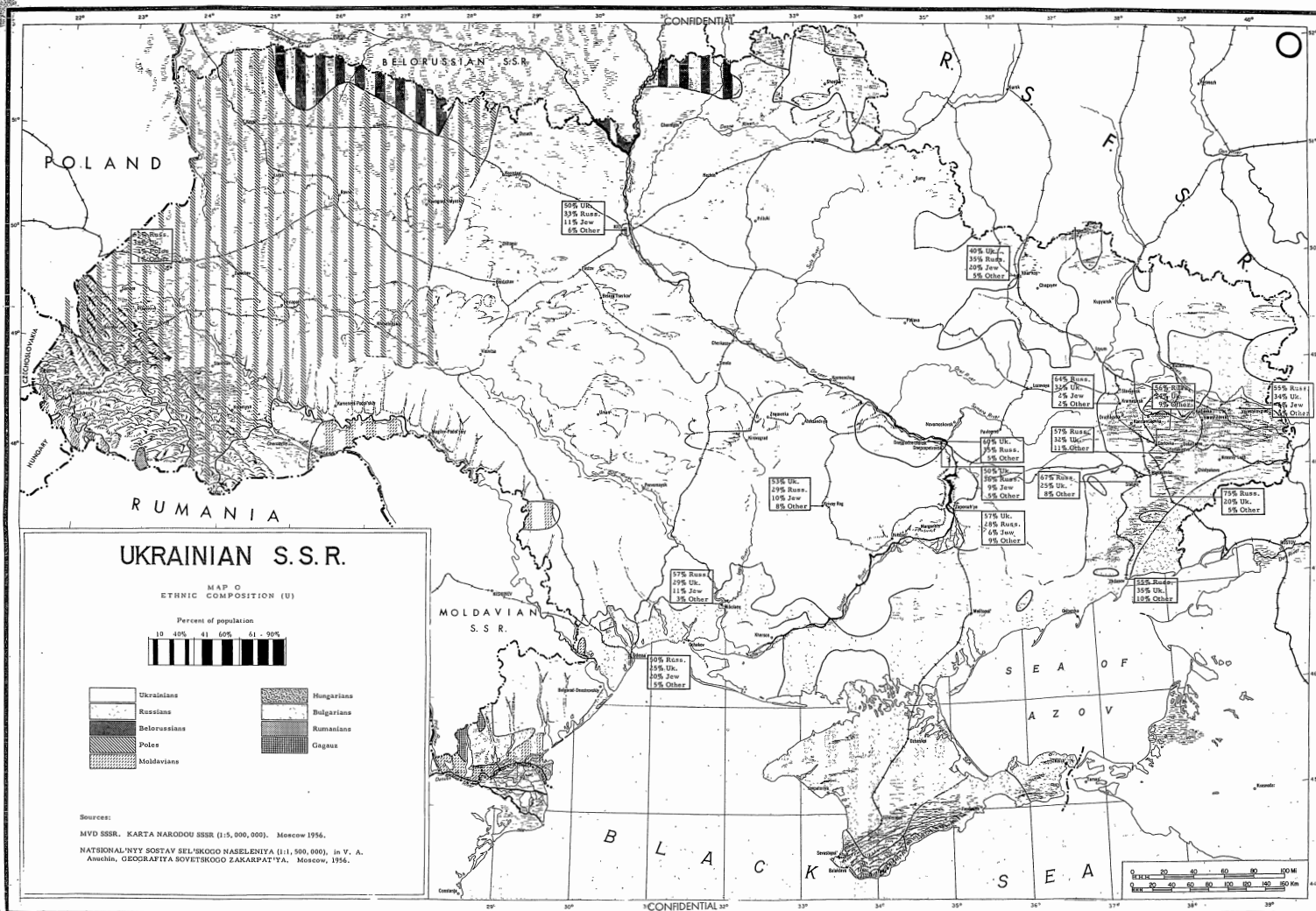
## d. Poles

The fourth largest ethnic group in the Ukraine is the Polish which numbers approximately 1,090,000 or 2.7 per cent of the total. Before World War II the Poles were only a small minority, but with the transfer to the Ukraine of Poland's southeastern districts in 1939, 1,830,000 Poles were added to the Ukraine. In the immediate post-war years a reported 787,500 of these were repatriated,<sup>11</sup> but nearly 600,000 remained.<sup>12</sup> They are concentrated now in the six western oblasts--Stanislavskaya, Drobychskaya, Rovenskaya, Volynskaya, Ternopol'skaya and L'vovskaya--where they constitute nearly 12 per cent of the population. In 1957 a new agreement was signed between Poland and the Soviet Union providing for repatriation of 500,000 Poles living in Belorussia and the Ukraine.<sup>13</sup> By April, 40,000 were transferred.<sup>14</sup> If the program is carried through to completion, the number of Poles in the Ukraine will be reduced by the end of 1958 almost to pre-war levels.

The 390,000 Poles living inside the pre-war boundaries of the Ukraine are concentrated in the four, right-bank oblasts--Kiyevskaya, Zhitomirskaya, Vinnytskaya, and Khmel'nitskaya. Over 50 per cent of them are grouped around the towns of Shepetovka, Berdichev, Khmel'nitskiy, Korosten', and Kamenets-Podol'sk, but principally in the rural areas rather than in the cities themselves. Nearly 80 per cent of the Poles in the Ukraine are engaged in agriculture. The rate of assimilation or Russification of the Poles in the past has been faster than for any other group except the Belorussian. According to the census of 1926, only 47 per cent of the Poles in the Ukraine spoke Polish in preference to Russian or Ukrainian.

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The importance of the Poles for Special Forces as a potential opposition group to the Soviet regime is uncertain. On the one hand, the Poles as farmers have been alienated as have the Ukrainians by the Soviet collectivization policy. In addition, many of them in the western, newly incorporated districts have been greatly affected by the transfer of their territory from Poland to the USSR, and although the most bitter of this group were repatriated, undoubtedly others remain who would welcome an opportunity to strike against the regime. On the other hand, there is perhaps an even stronger opposition between the Ukrainians and Poles, which would make it difficult for the two groups to join together against the Russians. The Ukrainians have traditionally identified the Poles with the landed aristocracy which until the eighteenth century subjected them to a rigid and impoverishing serfdom. More recently, in the period between the first and second World Wars, the bitterness of Ukrainians in the western districts was revived, as they were repressed in a similar way by the new Polish state. There is much evidence that during and after World War II the Poles and Ukrainians in the western Ukraine spent much of their energy fighting one another rather than the Germans or Russians. Although this opposition may now diminish, it seems unlikely that Ukrainians and Poles can be brought together in the immediate future to oppose Soviet rule. In view of the deep-rooted antagonism between Ukrainians and Poles, Special Forces are unlikely to find support from Polish groups in operations involving Ukrainian guerilla forces fighting for their own nationalist allies.



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3. Regional Variations in Population Attitudes (See Map P)

Although no precise measurement of the attitudes of the Ukrainian people toward the Soviet regime can be made, a number of broad conclusions on regional variations in loyalty and reliability can be suggested. The conclusions which follow have been formed on the basis of four considerations: (1) variations in ethnic composition, particularly in the ratio of Ukrainians to Russians; (2) regional variations in traditional attitudes toward Soviet rule as expressed during the civil war years (1917-1921); (3) variations in attitudes toward the German occupation of World War II (and in guerilla activities during this period); and (4) distribution and characteristics of resistance incidents and population attitudes after World War II.

## a. The Crimean Peninsula (Area I on Map P)

In two areas of the Ukraine the local populations apparently hold few grievances against the regime and probably would not assist Special Forces. The first is the Crimean Peninsula which has historically been a part of Russia, being incorporated into the Ukraine only in February 1954 when it was transferred away from the RSFSR because of its proximity to the Ukraine. Its population is predominantly Russian--more than 60 per cent--and in the past neither its Ukrainian nor Russian peoples have displayed nationalist feelings or indicated any hostility to the regime. During World War II the nearly 300,000 Tatars occupying the Crimean Mountains and certain districts in the northern steppes provided much assistance to German forces, killing from 70,000 to 120,000 Russians including war prisoners. However, immediately after the war the Tatars were deported to Central Asia, and apparently are not to be returned. Occasional Tatars who managed to escape deportation may remain in the mountain areas and would undoubtedly assist Special Forces.

The Tatars were replaced by Ukrainian and Russian colonists brought in to organize 170 new kolkhozes in the evacuated areas. If these colonists are typical of those sent to the newly developed agricultural regions in

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Central Asia, they can be expected to be strongly sympathetic to the regime. Intelligence reports have indicated that some of them are deportees from the western Ukraine, evacuated because of nationalist activity. These colonists can be expected to support Special Forces. Their numbers are probably small, however, and in general the new colonists should be considered as hostile elements.

Elsewhere in the Crimea there is little likelihood that Special Forces would find support or assistance. The southern slopes of the Crimean Mountains overlooking the Black Sea have been developed as one of the principal tourist centers of the Soviet Union and their populations are among the most loyal to the regime. The Kerch' Peninsula is being exploited as a source of iron ore, and its population is almost exclusively Russian and in addition is largely non-agricultural. Little assistance from the peoples of these regions could be anticipated.

b. The Donbass (Area II on Map P)

The second area with a population strongly loyal to the regime is the Donbass. Occupying the most important parts of the Stalinskaya and Voroshilovgradskaya oblasts, the Donbass is the center of heavy industry and mining in the Ukraine and apart from the Crimea is the least Ukrainian district in its population and national character. Ukrainians are a minority in the Donbass and those who live there are mostly urbanized, frequently speak Russian, and in many cases no longer consider themselves Ukrainians. During and immediately after World War I the inhabitants of the Donbass strongly opposed Ukrainian nationalists and at one point established a separate republic independent of the rest of the Ukraine. In the following years they defended Soviet rule and Russian interests, frequently attacking Ukrainian nationalists with greater zeal than Russian leaders themselves. During the German occupation in World War II there were no recorded instances of Ukrainian nationalist enthusiasm or of support for the Germans or hostility toward the Russians. Apparently many of the local inhabitants visualize themselves as occupying

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a Russian island in a Ukrainian sea, and hence identify themselves most strongly with Russian interests and Soviet rule.

c. The Northeastern Districts (Area III on Map P)

In two regions of the Ukraine Special Forces would probably find only limited support from the local inhabitants together with much hostility. The first occupies a belt extending along the northeastern edge of the Ukraine from the Dnieper River in the west to the Donbass in the southeast. This section of the Ukraine borders the RSFSR and includes many districts in which a majority of the population is Russian rather than Ukrainian. The Kharkov industrial center which traditionally has been identified as a Russian rather than Ukrainian city has extended its Russian influence into many of the outlying areas. Although there are many sections in which the population is almost exclusively Ukrainian--including the southern parts of the Chernigovskaya and Sumskaya oblasts--there have been few indications of strong nationalist feeling and little opposition to Soviet rule. During World War I the region was one of those most securely held by Bolshevik forces and its leaders frequently opposed the somewhat nationalist Communists from the western parts of the Ukraine. During World War II small nationalist bands were formed at Kharkov and Chernigov. The bands were overwhelmed, however, by the tremendous partisan units organized by Soviet leaders, and apparently were given little support by the general population. At Kharkov one pro-Russian partisan band was liquidated by the local inhabitants, but in most instances the Soviet partisans were freely supplied with food and shelter. In certain rural areas it might be expected that Ukrainians would not oppose Special Forces, but as long as there exists the possibility of reprisals from Russians so near at hand this threat would probably prevent them from offering positive assistance.

d. The Odesskaya Oblast (Area IV on Map P)

Ukrainian national feeling has also been relatively unimportant in the Odesskaya oblast in the southwestern corner of the Ukraine. The

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city of Odessa and its environs has been in the past the most cosmopolitan district in the Ukraine, with a heterogeneous population including important numbers of Greeks, Moldavians and Bulgars, as well as Russians and Jews. As a major port, Odessa has enjoyed wider contacts than its hinterland and has developed a less nationalist character of its own. Historically it has been considered a Russian rather than a Ukrainian area. During World War II there were few indications of nationalist or of anti-Russian feeling and the city of Odessa was in fact controlled by a strongly anti-nationalist local administration. The Izmail district, acquired from Rumania in 1940, has only a relatively small Ukrainian population together with important Moldavian and Bulgarian minorities. The attitude of the Moldavians and Bulgarians toward Soviet rule is unknown.

e. The Black Sea Lowland (Area V on Map P)

Adjoining the Odesskaya oblast to the east are the Nikolayevskaya, Khersonskaya, and Zaporozhskaya oblasts, occupying a large part of the Black Sea Lowland. Like the Odesskaya oblast this coastal area has a relatively sparse rural population with large-scale wheat farming predominating. The population is ethnically mixed, with a majority of Russians in many districts. During World War II there was apparently a limited amount of Ukrainian nationalist activity although it was not uniform throughout the region. In the cities of Nikolayev, Kherson, and Zhdanov there was much Ukrainian educational and cultural work, but it did not assume a strong, political form. After the war nearly 500,000 Ukrainians from Poland were resettled in the Nikolayevskaya and Khersonskaya oblasts. It is unlikely that these new settlers are strongly nationalist or anti-Russian in attitude, but they are more Ukrainian in character than the older inhabitants of the region.

f. The Dnieper Bend - Krivoy Rog Districts (Area VI on Map P)

The second region in which limited support from Ukrainian nationalists might be expected includes the Dnieper Bend and Krivoy Rog areas (the Dnepropetrovskaya and northern parts of the Zaporozhskaya oblasts).

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Bordering the Donbass on the west, the region is also industrial in character--second only to the Donbass in importance--and has also a large Russian population although Ukrainians are a clear majority. During and immediately after World War I the region joined with the Donbass in severing its connections with the Ukraine, and one of the most active Communist Party organizations developed in Dnepropetrovsk. The peasantry is preponderantly Ukrainian, but the cities are Russian and Jewish. In the period between the first and second World Wars industrialization proceeded at a more rapid rate than in any other region in the Ukraine. There was an influx of both Russian technicians and Ukrainian peasants to the areas around Krivoy Rog and along the Dnieper River between Dnepropetrovsk and Zaporozh'ye. The new inhabitants as well as the old apparently hold a strong nationalist convictions. However, during World War II there was considerable evidence under the German occupation that sizeable elements of the population thought of themselves as citizens of a Ukrainian republic, somewhat distinct from the USSR as a whole. In both Krivoy Rog and Dnepropetrovsk local administrations appeared which favored German efforts to abolish many of the distasteful aspects of Soviet life although they also opposed any strong Ukrainian nationalist expressions. No Ukrainian partisan bands appeared in the region, while pro-Soviet units occupied the woods in the bend of the Samara River as well as the swamps near Nikopol'. On the basis of German experience during World War II it seems likely that Special Forces would not be strongly opposed and might find limited support from both Russians and Ukrainians hostile to the Soviet regime. However, little nationalist Ukrainian sentiment would be expressed.

g. The Left-Bank and Northern Steppe Districts (Area VII on Map P)

A considerably stronger Ukrainian nationalist element is found in a belt extending in an east-west direction across the central Ukraine and continuing northward on the east bank of the Dnieper River. This belt is part of the traditional heartland of the Ukraine, and ethnic

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Ukrainians comprise more than 95 per cent of the total population in many districts. No major industrial centers have been developed in the region under Soviet rule, and the population is overwhelmingly rural. During and after World War I much support for Ukrainian nationalists was developed in the region, although the support was not as strong as in the districts to the north and west. During World War II there was considerable evidence of Ukrainian nationalist sympathy, and there were established a number of Ukrainian newspapers which urged a moderate, nationalist revival. At Poltava and Kirovograd, as well as at a number of smaller towns, Ukrainian nationalist administrations were established. On the other hand, at Vinnitsa an anti-Ukrainian city government was formed which apparently was not strongly opposed by the local inhabitants. No nationalist partisans were observed by the Germans, while there were extensive Soviet partisan units occupying the northernmost part of the left-bank district as well as the wooded areas along the Dnieper River between Cherkassy and Kiev. Small Soviet bands were also occasionally observed throughout the left-bank district and particularly near Priluki and north of Poltava.

#### h. The Right-Bank Districts (Area VIII on Map P)

In five regions of the Ukraine, Ukrainian nationalist, anti-Soviet sentiment is apparently moderately strong, and the population in these regions might be expected to provide active assistance to Special Forces in a number of localities. The first of these regions includes the right-bank districts of the Ukraine--the Cherkasskaya, Kiyevskaya, Zhitomirskaya, and Kmelnit'skaya oblasts. The region has traditionally served as a strong center for Ukrainian nationalists. Its principal city, Kiev, is not an industrial center as are the other principal cities of the Ukraine, and it includes a large Ukrainian population which has been little affected by Russian influence. During World War I the region provided greater support than any other region for Ukrainian, nationalist, anti-Soviet forces. When a Soviet government was finally established in the Ukraine, Russian uncertainty about the attitudes of the local population was indicated by Soviet insistence

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that the Ukrainian capital be shifted from Kiev to Kharkov--a more reliable and pro-Russian center. During the collectivization drive in the early 1930s the peasants of the region provided greatest opposition to the formation of kolkhozes.

Under German occupation during World War II there was considerable evidence of anti-Soviet, anti-Russian feeling. In the north--in Poles'ye--Ukrainian partisans were active at various times. At Olevska a nationalist republic was formed--the Olevska Republic--which under the Ukrainian, Taras Borovets', held the district for a short time against German and Russian forces alike. Although pro-Soviet partisans subsequently dominated the area, there is little evidence that they were supported by the local population. In numerous cities and towns throughout the region nationalist local administrations were established and nationalist sympathies expressed. At Kmel'nitskiy a strong, nationalist, local government was formed, and nationalist partisans were reported in the vicinity by German observers. At Bazar, a nationalist demonstration, drawing participants from distances of many miles, was organized. Other indications of nationalist feeling were strong at Zhitomir, Berdichev, in the districts southwest of Kiev, at Belaya Tserkov, Cherkassy, Korsun', Tarashcha, Vasilkov, Uman', and Zvenigorodka. Although the nationalists were less active and open than in the districts to the west, nationalist feeling was apparently strong. It is likely that Special Forces would receive at least moderate assistance in these localities.

#### i. Volynia (Area IX on Map P)

Even stronger anti-Soviet sentiment exists in the districts acquired by the Ukraine after World War II. Inasmuch as the newly-acquired territories have been subject to Soviet rule for only a relatively brief time span, they have adjusted less completely to the requirements of Soviet society. In addition, the territories have traditionally been less a part of the Russian domain than other parts of the Ukraine, and there is less acceptance by the local inhabitants of their incorporation

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into the Soviet Union. During World War II the northern parts of the newly-acquired territories--comprising the Rovenskaya and Volynskaya oblasts--became one of the strongest centers for Ukrainian partisans. For an important period of time the area bounded by the four towns of Kovel', Lutsk, Kostopol', and Vladimirets was completely dominated by nationalist bands, which fought successfully against both pro-Russian partisans and against German occupation forces. The region is a part of Poles'ye and its population consists chiefly of Ukrainian and Polish farmers occupying relatively small plots of land which are intensively farmed. The population is predominantly Ukrainian but there are important Polish minorities, and the two national groups have historically fought one another. It was here during World War II that Ukrainian-Polish rivalries were most strongly expressed.

After World War II resistance to Soviet rule continued strongly until 1950 and at a reduced level until 1955. Although large numbers of the local inhabitants have been deported because of their anti-Soviet attitude or their opposition to collectivization, many nationalists apparently remain, and Special Forces could expect considerable local assistance.

j. Transcarpathia (Area X on Map P)

The westernmost district of the Ukraine is the Zakarpatskaya oblast, acquired from Czechoslovakia in 1945. Its population is predominantly Ukrainian, but it includes a large Hungarian group which is concentrated in the lowlands and the cities. The Ukrainians traditionally have had little contact with Russians or with Russian rule, but have been strongly opposed to the Hungarian and German landowners in the region. The Ukrainians are predominantly backward peasants, living principally in the mountain districts. They are divided into three sub-groups--the Lemky, Boiky, and Gutsuly--distinguished from one another by their separate dialects and different national customs. They have apparently developed considerable nationalist feelings. Immediately before World War II a nationalist government headed by a Ukrainian priest, A. Voloshyn, established an independent Transcarpathian Ukraine with its capital at Chust. The republic opposed

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German efforts to transfer the area to Hungary, and for a short time fought against Hungarian troops, although it was ultimately conquered. In the immediate period after World War II there was little resistance, but after 1950 a number of incidents were reported centered in the wooded areas above Uzhgorod and in the Carpathian Mountains. Although the inhabitants of Transcarpathia are less politically conscious than the Ukrainians to the north, those living in the mountainous districts and hence relatively isolated from Soviet controls might be expected to support Special Forces.

k. Chernovitskaya Oblast (Area XI on Map P)

The sections of Bukovina and Northern Bessarabia absorbed by the Soviet Union from Rumania in 1940 were incorporated into the Ukraine as the Chernovitskaya oblast. The oblast includes one segment of the Carpathian Mountains and a portion of the right bank of the Dnestr River. In the eastern districts almost half of the population is Moldavian; elsewhere, however, Ukrainians are a clear majority. Traditionally there has been little evidence of Ukrainian nationalist feeling in the oblast, although in the period of World War II Ukrainians fought with some success against Rumanian forces. No extensive areas were dominated by partisans during the war, but German observers noted a number of Ukrainian partisan bands in isolated mountain districts. Rural population density is higher in the oblast than in any other part of the Ukraine, and because of the mountainous terrain, farming has been concentrated on relatively small plots and is less suitable for collectivization than the broad steppe districts elsewhere in the Ukraine.

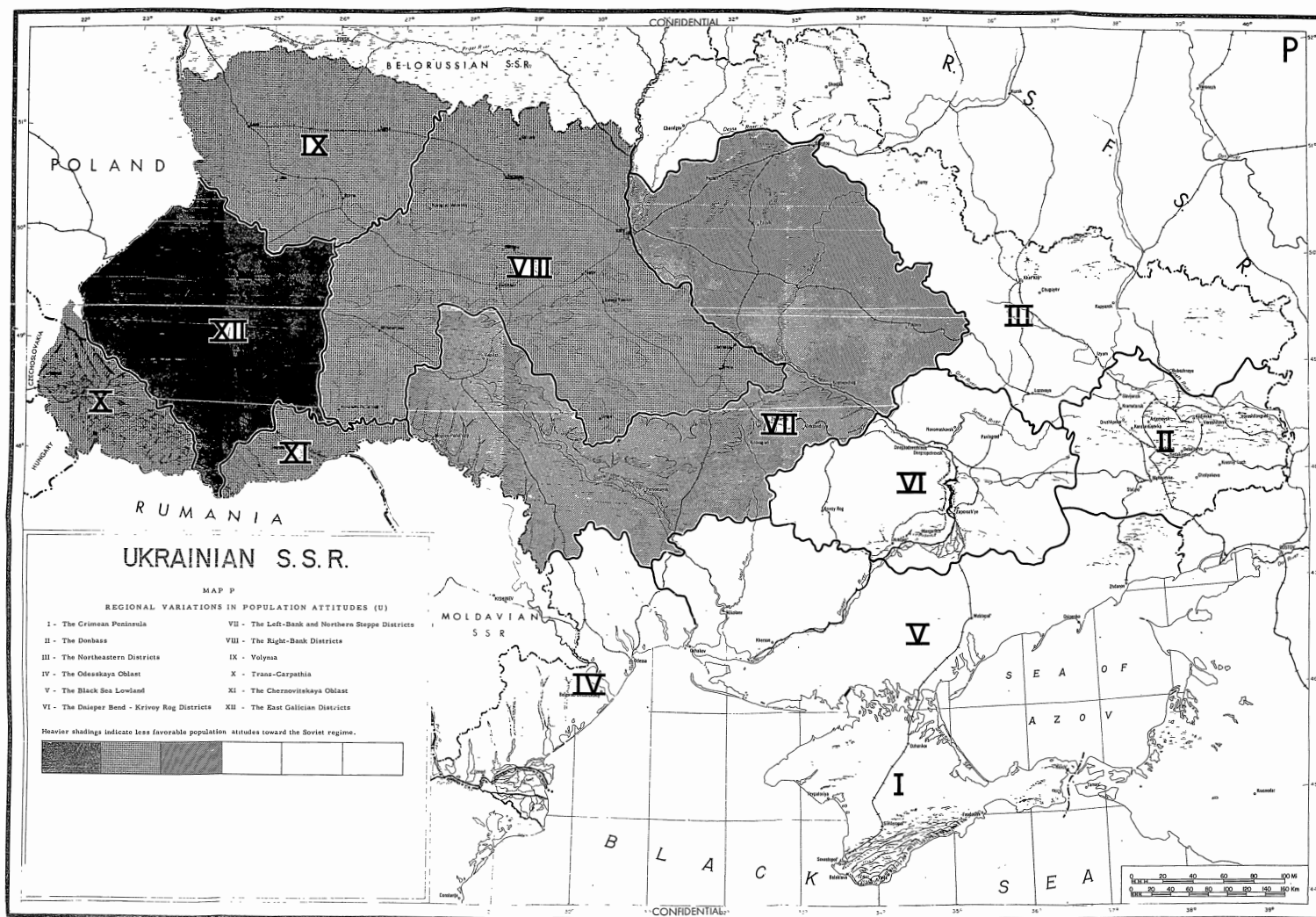
After World War II numerous resistance incidents were recorded in the vicinity of Chernovtsy, along the Dnestr River valley, and at many points in the mountains. Incidents have been reported as recently as 1956. Although Special Forces should avoid the lowlands and valley regions where Soviet control measures are more effective, they could expect considerable support from Ukrainians in the mountains.

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## 1. The East Galician Districts (Area XII on Map P)

The last region in the Ukraine, and the one with the most strongly nationalist population, includes the Stanislavskaya, Ternopol'skaya, Drogo-bychskaya, and L'vovskaya oblasts. The region's history of anti-Russian feeling has been stronger than in other parts of the Ukraine. Before World War I it was a part of the Austrian-Hungarian Empire, and Ukrainian nationalists were moderately encouraged: Ukrainian scholarship and intellectual life developed, and the region became a center for those with nationalist aspirations. During World War I the region provided the largest Ukrainian military units and was the last stronghold of those favoring Ukrainian independence. After the war it became a part of Poland and continued to grow as a center of Ukrainian nationalism. The Polish government, despite its assurances that the rights of Ukrainians would be protected, attempted to repress Ukrainian institutions and to colonize Polish settlers in the region. The efforts were only partially successful, and the region remained a Ukrainian nationalist center until World War II. With the German invasion of Russia in 1940, the Ukrainians immediately assumed control, declaring the formation of an independent state with its capital at L'vov. The nationalists were immediately suppressed by the German occupation, but throughout the war nationalist activity was extensive and nationalist partisan bands opposed both German forces and pro-Soviet partisans with some success.

After World War II resistance to Soviet rule was expressed on a great scale in the years from 1945 to 1950 and on a limited scale until 1956. Although there have been extensive deportations from the area, many nationalists remain, and there are perhaps isolated partisan bands in the more remote wooded areas of the Carpathian Mountains. It is in this region that Special Forces could expect considerable support from the local Ukrainian population, including active participation in measures directed against the Soviet regime.



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PART IV

SECURITY FACTORS AFFECTING SPECIAL FORCES OPERATIONS

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1. Security Factors (See Map Q)<sup>1</sup>

Two large uniformed groups which pose serious hazards to the operations of Special Forces are found in the Ukraine. The first, and more important from the standpoint of Special Forces planners, consists of the security troops of the MVD, divided into the Border Troops and the Interior Troops. The Border Troops are responsible for the security of the Soviet frontiers whereas the Interior Troops serve as the ultimate bulwark for the internal stability of the regime. The regular ground forces of the Soviet Army constitute the second uniformed group encountered in the Ukraine. Although its mission is not like that of the security forces, the army demands special attention inasmuch as it is present in considerable strength. Map Q, based on the latest (July 1957) order of battle holdings of ACSI, indicates confirmed locations of security and ground forces within the Ukraine. It furthermore depicts the security zones along the frontiers where stringent controls are in effect.

## a. Border Troops

The Border Troops, believed to be subordinate since the spring of 1957 to the Committee of State Security (KGB), are dispersed along the land frontiers with the satellites and also are charged with the security of the coastal area of the Black Sea. Three Border Districts have been designated in the Ukraine: the Ukrainian Border District, with headquarters at L'vov; the Southwest Border District--Odessa; and the Black Sea Border District--also Odessa. The headquarters of the various detachments subordinate to these Districts are indicated on Map Q. Each detachment is responsible for a particular sector of the frontier. The detachments are subdivided into commands and each command consists of several outposts. It is the outpost which organizes the individual patrols that operate directly along the frontier. In addition to the Border Troops, Civilian Cooperative Brigades may be organized among the inhabitants of the border zones for the purpose of informing on and detaining suspects.

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## b. Interior Troops

The Interior Troops, the most significant element of the MVD, are charged with the destruction of the regime's internal enemies that cannot be dealt with by the other overt and secret police organizations of the USSR. It is an elite organization which includes operational troops and various types of guard units. Beyond the limits of the border zones, this is the group with which Special Forces would have to contend most seriously. The confirmed locations of components are depicted on Map Q. Unit designations and additional information on the make-up and dispersal of the Interior Troops are available at ACSI.

## c. Soviet Army

Of interest to Special Forces planners is the fact that the Ukrainian SSR is the site of a considerable body of the ground forces of the Soviet Army (over 30 divisions). Units are divided among three military districts--Carpathian, Kiev, and Odessa (the Tauric Military District has been incorporated into the Odessa Military District). Of these three military districts, the Carpathian, which has some of the best terrain and cover for Special Forces operations, has the greatest concentration of military units. Identified units are garrisoned in towns convenient to the western frontier of the Ukraine, and in towns and cities located on the more hospitable upland area that lies between the rugged Carpathian Mountains to the southwest and the vast marshlands of Poles'ye to the north and northeast. Units are much more widely dispersed in the Kiev and Odessa Military Districts and there are broad areas in which there are no OB holdings at all. However, it must be remembered that in many cases only the divisional headquarters is given a location, and the whereabouts of the divisional components is not known.

The role of the army in the matter of border security is a limited one. It can be expected to "backstop" the border troops along the frontier; the disposition of ground forces in the westernmost part of the Carpathian Military District would seem to indicate that this purpose is being served. Similarly,

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in the matter of internal security, the army can be expected to act only in the event of unusual circumstances when revolt or unrest would reach proportions serious enough to challenge the capacity of the Interior Troops of the MVD to cope with such situations. The significance of the ground forces of the Soviet Army, therefore, lies predominantly in a different sphere of activity from that in which Special Forces are expected to operate.

## d. Other

In addition to the foregoing there are other groups which would present threats of varying degree to Special Forces operations. Included among these are the Signal Troops of the MVD, the MVD Air Brigade, the militia, plant guards, kolkhoz guards, etc. The entire southern border of the Ukrainian SSR fronts on the Black Sea and the Sea of Azov and coastal patrols under naval as well as MVD control can be expected. Air Force installations are scattered throughout the Ukraine and are identified in the appropriate volumes of the USAF publication Airfields and Seaplane Stations of the World.

A number of Ukrainian garrison cities are the subject of special studies by the Georgetown University Research Project. Each study includes a detailed town plan, a large scale map of the surrounding area, a summary of data on all military and security forces installations, and a brief text on the city's history, economy, transportation facilities, and military importance.

2. Frontier Security Zones

Although the Ukrainian sector of the European frontier of the USSR fronts on four satellite countries, the Soviets are far from considering this a sufficient guarantee of security. From north to south the Ukrainian boundaries with Poland, Czechoslovakia, Hungary, and Rumania are tightly sealed. Controls are stringent and unrelieved throughout, but some variations exist from place to place largely because of terrain differences or because of dense settlement.

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## a. The Polish Frontier

Throughout the sector which constitutes the Ukrainian-Polish frontier, the Soviets have established three parallel zones designed to make the border impenetrable. Proceeding from the frontier there is first a zone which is about 875 yards in width. This belt has been entirely depopulated and has been leveled and cleared of trees. Watchtowers are reported to exist within this zone and are probably spaced about 500 yards apart. Broad wire barriers enclose the intervals between the watchtowers. A plowed and raked strip parallels the wire entanglements and is under constant surveillance for footprints. Alarm devices, some of which release flares upon contact, and regular patrols by border guards contribute to the maximum security of this zone.

A second zone, about 9 miles in depth, proceeds from the first zone toward the interior. This zone has not been entirely depopulated, but inhabitants are strictly regulated and are issued temporary passports. Movement within the zone is limited and special authorization is required for all arrivals and departures. Outposts manned by guards are scattered throughout as well as "observation points" equipped with machine guns, telephones, and radios. Some defensive strongpoints have also been established.

A final zone extends from the periphery of the second zone for about 50 miles into the interior. Here, too, the population is rigidly controlled by means of surveillance, temporary passports, and restrictions on movement, particularly in respect to ingress and egress.

## b. The Czechoslovakian Frontier

The course of the Ukrainian SSR-Czech border is closely guarded by numerous posts scattered along its length of 71.4 miles. Defense points are regularly established between the border posts and are reportedly well-concealed bunkers located on hilltops. These strongpoints are equipped with machine guns, rockets, flares, and telephones. The frontier itself is indicated by a narrow strip of cleared land. Behind the actual frontier area, on the Soviet side, there is a plowed and raked strip about 50 feet wide.

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High wooden watchtowers, spaced about one-half mile apart, dominate this area. Various parallel zones proceeding from the frontier toward the interior of the USSR are presumed to exist.

## c. The Hungarian Frontier

An elaborate system of border security is reportedly in operation along the frontier with Hungary. A series of distinct zones or belts, varying from a few yards to many miles in depth, are said to extend into the interior of the USSR. The first is simply a clearing, about 55 yards wide, paralleling the border and bounded by a barbed wire fence with electrically charged wires. East of the fence lies a second zone, about 220 yards wide, largely marshland, and containing an alarm wire which releases rockets when tripped. The third area consists of an artificial swamp about 325 yards wide in which there is a zigzag strip of carefully raked earth. This is followed by a plowed and raked strip about 325 yards in width bordered by a cleared path for patrols. Wooden watchtowers, spaced at 550 yard intervals, are next encountered in an uninhabited and swampy zone about 550 yards in width. This is succeeded by a "Forbidden Zone" about one mile in depth in which the only inhabitants are hand-picked Communists with special identification documents. The final zone, that most removed from the frontier, is about 20 miles broad. Residence in this zone is restricted to Communists and trustworthy peasants, all of whom are subject to special identification control.

## d. The Rumanian Frontier

The greater part of the Ukrainian-Rumanian frontier is aligned from the tri-junction point of Hungary, Rumania, and the USSR in the west, to the meeting point of Rumania, the Ukrainian SSR, and the Moldavian SSR in the east. The Moldavian SSR then represents a lengthy interruption of the Ukrainian-Rumanian frontier, until the Ukraine and Rumania again share a frontier in the south in the region of the Danube delta. As is the case with the other European frontiers of the USSR, strict security measures are in effect along the Ukrainian-Rumanian border.

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Four border zones are reported. The first consists of a 13-foot zone, completely cleared, immediately adjacent to the frontier. The second zone extends 550 yards from the first and is unrelentingly supervised by the frontier troops. The civilian population has been evacuated from this zone and various barriers such as concrete blocks painted black and white have been erected in most sectors. The third zone, which extends about 4-1/2 miles back from the frontier, is the one in which concealed observation points have been established. The fourth and final zone extends into the interior of the USSR a distance of approximately 14 miles from the border. Here the population is carefully screened for its reliability and is subjected to close surveillance and document control.

Border fortifications consist of bunkers spaced at fairly close intervals. Each bunker is believed to be manned by a six-man gun crew. Watchtowers equipped with searchlights and machine guns complement the bunkers. Other obstacles such as electrically-charged barbed-wire fences and wooden fences have been reported. The usual foot patrols, sometimes accompanied by dogs, are also encountered. An additional and natural obstacle is encountered in the region where the Danube River constitutes the frontier between the Ukraine and Rumania. River patrols are maintained on the Danube.

Patrols, physical barriers, and zonal control of the frontier population are also typical of the satellite countries sharing a frontier with the Ukraine. Such security measures lend additional effect to the relative impenetrability of the Ukrainian frontier. If an escapee fleeing westward succeeds in crossing the Soviet border the appropriate satellite security forces are alerted and the manhunt is underway. There are some indications that Soviet border guards carry on espionage activities beyond the frontier on satellite territory.

The role of forced labor in the Ukraine and its particular application to the operations of Special Forces have not been considered in the preparation of this report. The swift pace of recent events in the USSR, and the effect of these on many facets of Soviet life, are still open to evaluation. Not

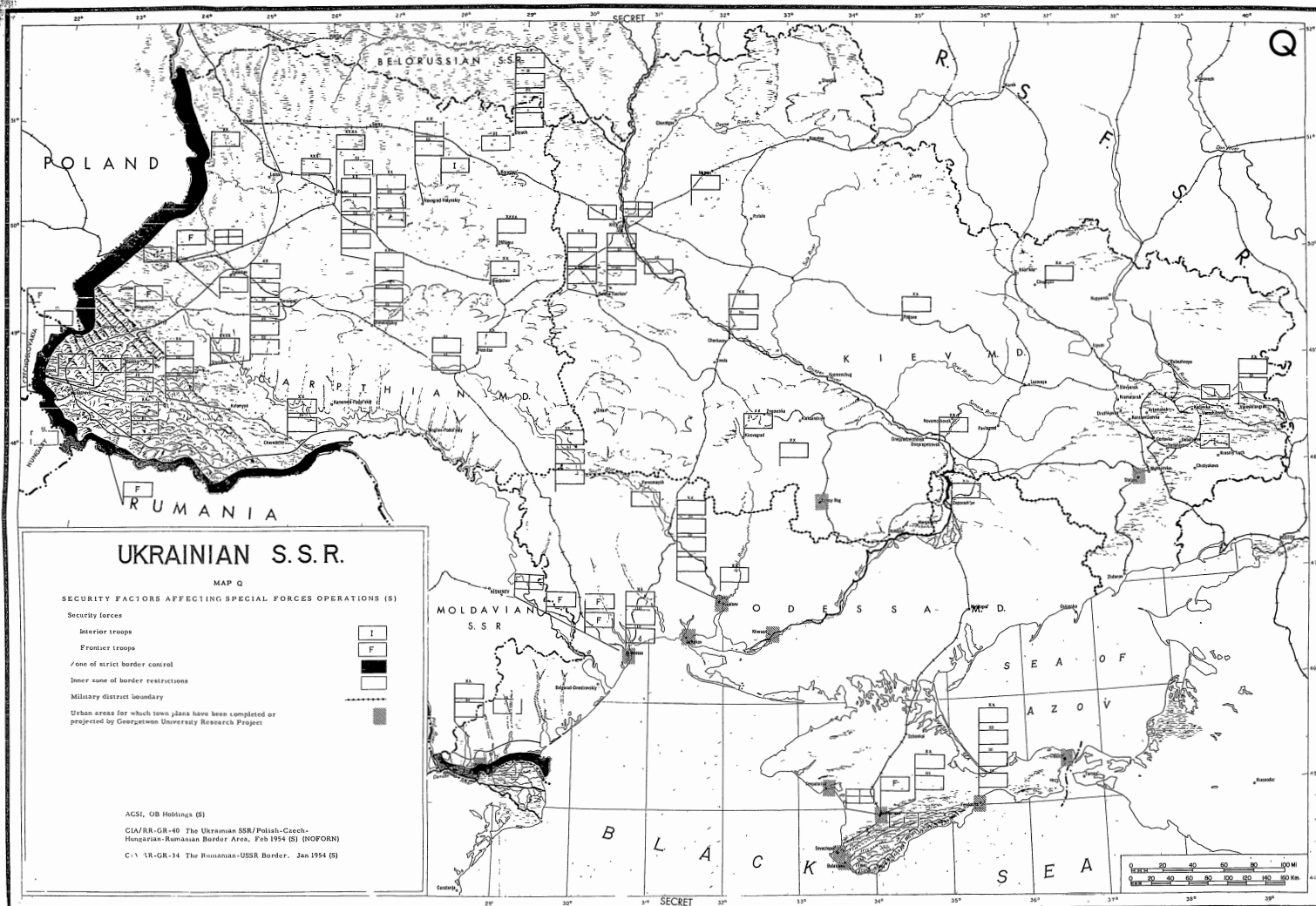
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least among these questions is the position which forced labor currently occupies in the Soviet system. The Ukraine has never been noteworthy as a forced labor area, but a listing of identified forced labor camps, with various dates of information, is available in: Center for International Studies, NKVD Labor Camps, Final Report on Project Mango, CI/B/55-3 (Cambridge: Massachusetts Institute of Technology) June 1955 (S).

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PART V

ECONOMIC VULNERABILITIES

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1. Introduction

Special Forces, by the nature of their assignment, are normally limited to rural areas offering opportunities for long-term concealment. Nearly all important manufacturing activity, however, is located in densely settled urban areas. So are most of the critical power, transportation, and communications installations. Important economic activities carried on in rural areas are restricted largely to agriculture and mining. Agricultural production is much too dispersed to offer suitable targets for Special Forces interdiction. Small concentrations of critical facilities such as machine and tractor stations, grain elevators, and the like, do exist and may conceivably be considered by Special Forces. Mining activity in rural areas is only occasionally vulnerable to Special Forces action because of the concentrated nature of mining settlements and the usually exposed or inaccessible area of mining operation. Mining, however, unlike agriculture, is physically vulnerable whenever there is a dependence on shafts and galleries, on extensive mechanical equipment, on electric current, and on major pumping and ventilating equipment. It may be mentioned that the old mining areas, which frequently have numerous abandoned shafts and exhausted mines, provide effective concealment for small groups even in regions of dense settlement and unsuitable topography and vegetation.

Urban areas are not self-sufficient. The survival of their population depends on the continuing flow of food and water, and their wellbeing depends on availability of power, gas, and other public utilities, on consumer goods, medical supplies, and many other products and services. The functioning of urban manufacturing plants depends on the continuing flow of raw materials, electric power, and other inputs. The utilization of manufactured products hinges on their shipment to centers of consumption. The operation of the administrative and control agencies centered in urban areas requires the uninterrupted flow of information and instructions. Therefore the interdiction of transport lines: rail, highway, waterway, pipeline; of communications: radio, telephone, and telegraph; and of power transmission networks can deny the use of urban

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facilities just as effectively as the destruction of the urban areas themselves, although for a briefer period. Such indirect interdiction can be a substitute for the physical destruction of the urban areas; it can also supplement the effects of direct interdiction by hampering disaster relief and reconstruction efforts.

A general survey of the geographical distribution of critical productive facilities is necessary, even when such facilities are beyond the reach of Special Forces, in order to determine the probable consequences of interdicting specific transport, communication and power lines. Such a survey can also provide the basis for determining at some future date the most promising target system and specific targets in terms of achieving particular desired effects on Soviet economic or military activities.

Most of the target systems considered below are at all times of great economic significance but would also prove to be indispensable to military activity in case of war. This is true particularly of the railroads. The highway system, on the other hand, has no economic importance beyond its function as a local collecting and distributing network. Its principal strategic significance is military. Finally, the radar warning chain stretching along the Black Sea coast may be of extraordinary military interest but plays no economic function whatsoever. Another means of distinguishing between these various target systems is in terms of the conditions under which their operation is vital. Those playing an essential role in the operation of the economy are strategic at all times and under any conditions. Others, such as highway networks and individual roads, would only be of interest to Special Forces under very specific and therefore improbable circumstances. The contingent nature of some of these target systems justifies emphasis on those systems whose value as targets transcends particular military situations. It is not the purpose of this report to evaluate target systems and select targets. It should be pointed out, however, that the relative importance of particular target systems depends upon the urgency with which interdiction is

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required. Cutting off flows of raw materials to basic industries has no immediate effect on military effort. Months and even years will pass by before the stockpiles of raw materials and semi-finished products are used up and the effect of interdiction is felt on the supply of military end-items. On the other hand, the effect of cutting off the flow of military end-items from their manufacturing plants or from their base stockpiles to areas of operation will be felt almost immediately. Such considerations strengthen the emphasis which this study places on the railroad network because this network is necessary for the deployment of military end-items, including military manpower, to areas of operation, as well as to transport the whole array of raw materials, semi-finished goods, and finished products from centers of production to centers of consumption.

## 2. Transportation

### a. Introduction

The great bulk of the Russian population and industrial plants is concentrated in the European USSR and in the Urals area. Its important sources of raw materials, however, are much more widely scattered. Russia's strategic requirements have led to the development of raw materials sources in remote areas. Strategic requirements of a military nature maintain large troop dispositions and extensive military installations around the far-flung periphery of the USSR proper and that of the Soviet bloc. These troops and installations must be supplied from distant sources of production. The highly dispersed location of Soviet economic and military resources requires extraordinarily long transport hauls.

The lack of regional self-sufficiency, largely based on unbalanced local supplies of materials and on climatic restrictions on agricultural production, results in a great deal of cross-hauling between complementary economic regions which may be separated by thousands of miles. The relatively low population density, even in the European sections of the USSR, combined with the highly specialized nature of production, require great dependence upon mutual exchange by long-distance transport. The transformation of agriculture from a peasant

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organization with a great degree of local self-sufficiency into a highly specialized commercial organization with large-scale units and extreme local specialization has placed a very large additional burden on transport nets. The farmers now must purchase most of their tools, consumer goods, and even agricultural products, which formerly they provided for themselves. Farm mechanization has increased the requirements for machinery, commercial fertilizer, fuel and other supplies which cannot be locally manufactured. The obverse transformations, increased market surpluses and the rapid urbanization of the population have also greatly enhanced the dependence on transport nets. Additional developments which have also increased the amount of cross-hauling include the construction of entire new manufacturing towns and mining areas under forced draft, and often in regions completely lacking in the necessary infrastructure.

As a result of the very long average haul and of the extraordinary amount of cross-hauling and mutual exchange required by the nature of the Soviet economy, transport plays a role in Russia which it probably does not have in any other country in the world. From a national standpoint, transport is a cost which must be paid for gathering raw materials and for distributing finished products. This cost is a very large share of Soviet national output. About 25 per cent of Soviet coal production is used by the railroads alone. Thirteen per cent of total steel production is consumed by railroads, of which 8.5 per cent goes into locomotives and rolling stock. These percentages are much higher than they were in the U. S. before World War II and even in the U. S. they are considerably higher than in smaller, more compact Western European countries. Railroad employment is estimated at three million, not counting forced labor widely used in railroad construction. A much larger share of the labor force is absorbed by transport in the Soviet Union than in the United States or Western Europe. Railroads are by far the most important means of long-distance transport, waterways being the only other significant means. In many regions there is no alternative to railroads, and in all inland regions where water transportation is available it is seasonal in nature because of the

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severe winters. Since the railroads consume such a substantial share of solid fuel, and also considerable amounts of steel, gravel, lumber, etc., an appreciable proportion of their freight movement--perhaps 15 per cent--is required for railroad operation.

Interdiction of lines, a major part of whose traffic load consists of supplies for railroad operation, has a "multiplier" effect, i.e., it will disrupt the operation not only of the railroad in question but of railroads obtaining their supplies by this route. Vulnerability of transportation is also enhanced by the long average haul. The time required for such hauls is so long in many cases that any disturbance to the smooth flow of traffic, whether accidental or intentional, may interrupt the productive activities of manufacturing establishments as well as the supplies of urban areas unless adequate stockpiles are on hand at the point of consumption. Stockpiles in the Soviet Union are notoriously inadequate. A further aspect of vulnerability is the lack of alternate means of transportation in most areas of the Soviet Union. Not only are waterways usually lacking or inadequate, but in many cases there are no practicable alternate rail lines, or even if such alternates exist, their capacities are insufficient. Because the mileage of alternate rail routes is generally greater than that of the regular routes, use of such alternates requires either considerable additional rolling stock or greatly intensified use of existing rolling stock. Locomotives and rolling stock in the Soviet Union are already used quite intensively and in many cases, particularly during peak harvest seasons, are unable to transport with dispatch the freight on hand. The shortage of freight cars seems to be greater than the shortage of locomotives. To the strictly transport sources of vulnerability should be added certain sources of a more general economic nature, namely the lack of alternate sources of supply should one source be interdicted, and the limited possibility of using substitute materials or products.

The foregoing remarks on the Soviet Union as a whole apply in every case to the Ukrainian SSR in particular. The transport pattern of the main products

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of the Ukraine and of the main items which it obtains from outside will be detailed below in Section 5. At this point only three will be mentioned in connection with the vulnerability of rail transport: coal, iron ore, and wheat. Wheat, a major Ukrainian product, is exported in very large amounts to central and northern Russia and to the Urals region. The most heavily populated portion of Russia, in the Moscow and Leningrad areas, are large deficit areas with regard to grains and to other agricultural products. The iron ore from Krivoy Rog and Kerch' is a principal source of supply for the steel industries of Poland and Czechoslovakia. The long rail haul required would be considered uneconomically long in the U. S. The third example of great dependence upon long-distance transport is the coal from the Donbass. Although some of this coal is consumed in the Donbass steel industry, many millions of tons are shipped north, east, and northwest to areas with considerable industrial development but no local sources of bituminous coal. It is not the Soviet Union's lack of large alternate sources of iron ore and coal which make the Ukrainian sources of critical value and their interdiction of serious impact on the Soviet economy. It is the fact that alternate sources are thousands of miles away which make their utilization impractical.

b. Railroads<sup>1</sup> (See Map R)

The railroad network in the Ukraine, with 20,400 kms. of line, is the densest of the Soviet Union, averaging 34 kms. of line per thousand kilometers square of area. Nearly all interregional domestic freight and passenger movement within the Ukraine and between the Ukraine and other parts of the Soviet Union goes by rail. The only exception is the traffic with the Caucasus, much of which goes by sea. The Dnieper River is the only significant waterway in this region but its total traffic of not much more than 5 million tons is small in the over-all transport balance of the Ukraine. Only along the Black Sea coast is water transport of importance.

The rail network in the Ukraine is part of an irregular spiderweb-shaped system with its center in Moscow. Four main lines originating in Moscow form

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the spokes of the Ukrainian rail network. The easternmost trunk line, which passes through the eastern corner of the Ukraine in the Donbass region, goes to Rostov and beyond to the Caucasus. This line is mostly double-tracked but it is reported single tracked from Millerovo to Gryazi in the RSFSR. The central spoke in the Ukrainian railroad net goes from Moscow through Kharkov and Zaporozh'ye to Sevastopol' in the Crimea. This line is double-tracked throughout from Moscow to south of Zaporozh'ye, but has a short single-tracked sector between Zaporozh'ye and the Crimea and is single-tracked throughout in the Crimea. In between these two lines runs a third and also important line originating in Moscow and passing through Yelets and Lisichansk to the heart of the Donbass industrial region. From the complex network of single-tracked and double-tracked lines in the Donbass, two double-tracked lines go south to the Sea of Azov ports of Zhdanov and Taganrog. They may be regarded as continuations of the central Donbass line, which is double-tracked throughout. The westernmost trunk line goes southwest from Moscow through Kiev to Zhmerninka. Most of the Ukrainian sector is double-tracked but the sector from Konotop to Naviya in the RSFSR is single-tracked. A double-tracked connection from Konotop to Kursk links the Kiev line to the Kharkov line and provides it with an alternate double-tracked route to Moscow. An important branch of the Kiev line originating at Bakhmach terminates at the Black Sea port of Odessa and provides the most direct route between Odessa and Moscow. It is single-tracked throughout, although the sector between Odessa and Bobrinskaya has a double-tracked right-of-way.

These main lines are basically oriented in a north-south direction. The only direct interregional routes which are not so oriented are the two parallel lines from the Donbass to Kovel', the northernmost going through Kiev and the more southerly going through Dnepropetrovsk and Rovno. These lines have connections from Kovel' north to the Baltic and west to Poland and East Germany. The route through Kiev is mainly single-tracked although it has double-tracked sectors northwest of Kiev and in the Donbass. The route through Rovno is double-tracked excepting for a short sector southeast of Kovel' which has a single

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track but a double-tracked right-of-way. The other rail lines in the Ukraine which connect the main trunk lines and provide east-west communications are a series of short sectors which provide only roundabout and generally low capacity east-west transit. A route from Odessa to L'vov with connections at L'vov west to Poland and East Germany and other connections at various points to Czechoslovakia, Hungary, and Rumania, is essentially a series of connecting links between transport routes to the East European satellites. In spite of the fact that they do not originate or terminate large amounts of freight, these lines, and their concentrations in the western Ukraine, are very important because of their role as the vital link between the major East European satellite transport systems and the USSR. Various portions of the L'vov-Odessa line serve as sectors along the east-west transit routes and can provide rerouting possibilities should any of the connections with the satellites be interdicted.

The density of the rail network in the Ukraine shows great regional variation. The network is densest in the west and west-central portion of the Ukraine which corresponds to the borders of former Polish territory and the limits of the most intensively cultivated black earth region. A second area of high rail line density lies between the Dnieper Bend and the eastern limits of the Ukraine, a region including the Donbass. The northern limits of the Ukraine where it borders on Belorussia have a sparse rail network. The rail network thins out along the southern Ukraine until it is reduced to a few lines terminating at Black Sea and Azov Sea ports. There is no east-west rail through connection at all near the Black Sea coast. This function, however, can be performed by the Soviet Merchant Marines plying these waters. The intensity of railroad utilization in the USSR is greater on the average than anywhere else in the world. The average before World War II was well over 4.6 million tons per route mile, and the 1960 goal is eleven million tons. No separate figures are available for the Ukraine, but there is every reason to believe that, if anything, the traffic density here exceeds that of the USSR

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as a whole. The main items of railroad traffic are wheat, coal, iron ore, and forest products, mainly lumber. Wheat is shipped in all directions from the main producing area center on the L'vov-Kiev axis. Some goes south to local consuming centers and to the Black Sea ports for export. Some goes east also to Ukrainian centers of consumption. The bulk of the wheat shipments, however, goes north and northeast to Central Russia. Wheat for the Donbass mainly comes from the area east of the Ukraine and not from the L'vov-Kiev area. The industrial crops which are grown principally near the Black Sea coast and the coast of the Sea of Azov as well as the sub-tropical crops of the Crimea all flow toward the north. Iron ore, which originates mainly in the Krivoy Rog area, and secondly from the Kerch' area, is largely consumed in the Ukraine proper. Krivoy Rog ore moves east by rail to the Donbass. Some ore, amounting to three million tons a year for Poland alone, and possibly a larger amount for the other satellites, moves west and northwest. Krivoy Rog ore is also shipped to the Moscow region and possibly to the Urals in a northeasterly direction. Ore from Kerch' goes mainly by sea to the steel center of Zhdanov. There are reports that some Kerch' ore is being exported to the European satellites. A large portion of the coal production of the Donbass is consumed locally as a source of electric power and as a raw material in the steel and chemical industries. The greater part, however, is shipped in all directions. The bulk of the shipments goes north to Central Russia. Some goes east to the Volga region and some west to supply portions of the Ukraine lacking an adequate local fuel. The extreme western Ukraine probably receives very little Donbass coal, depending partly on local resources of petroleum and brown coal and partly on Polish shipments. Forest products flow into the Ukraine, which is a large deficit area in these products, from Belorussia in the northwest and from Central and North European Russia to the north. Some forest products originate in the Carpathian region of the western Ukraine. Their main destination is the Donbass although the iron mines of Krivoy Rog and manganese mines of Nikopol', which are now mainly underground, probably also require large amounts of pit props. Among

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other important bulk shipments are the manganese ore from Nikopol' which flows east to the Donbass and northeast to the Moscow and Urals metallurgical industries. Petroleum products from the Caucasus are shipped in large part via the Black Sea and by way of the Grozny-Trudovaya pipeline. From Rumania they come by sea and by pipeline to Odessa, with considerable amounts also coming by rail.

Nearly all locomotives used in the Ukraine are steam-operated and coal is almost exclusively the type of fuel used. A few diesel-electric locomotives are used in passenger trains. Electrification plans are ambitious but at present electrified mileage is small, and even in this mileage most trains are steam-operated. The Zaporozh'ye-Krivoy Rog - Pyatikhatki - Dnepropetrovsk rail ring is almost completely electrified. Other electrified line sectors are Kiev-Fastov and, in the Donbass, Debal'tsevo-Zverevo.

Coal for the operation of railroads comes from the Donbass and could not be readily replaced from other sources. Electrification will considerably increase the capacity of rail lines and appreciably reduce their cost of operation. A further advantage of electrification is that it will economize on coal, which is more efficiently used in providing current than in providing steam, and economize on rolling stock and rail line capacity, which is now in part employed for supplying locomotive fuel. The main sources of power for electrified railroads will remain the coal-powered stations in and around the Donbass and the hydroelectric stations built and under construction on the Dnieper. The rail network in the Ukraine will remain vulnerable through its fuel supply because there is no nearby alternative source for fuel and because the rail network itself is needed to transport fuel.

From a military standpoint, the rail network in the Ukraine is highly vulnerable because it is poorly adapted for heavy east-west traffic. Particularly important points of vulnerability for east-west traffic are found along the borders of the Ukraine with Rumania, Hungary, Czechoslovakia, and Poland. The main trans-shipment facilities between the USSR and Poland are around Brest and west of L'vov.<sup>2</sup> The facilities at Brest and at Terespol on the Polish

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side of the border are north of the Ukraine but are accessible through the Brest-Kovel' rail line. The main connection with south Poland is by way of a double-tracked line from L'vov to Medyka to Przemysl on the Polish side. Trans-shipment facilities are found on both sides of the border. Other Polish connections from Przemysl and from Sanok in Poland converge on Sambor and through Sambor to L'vov. Trans-shipment facilities at Rava Russkaya are less important but are used for traffic between the Ukraine and central and northern Poland.

The main trans-shipment center for traffic between the Ukraine and both Hungary and Czechoslovakia is Chop. Parallel standard and broad gauge lines lead from Chop to Cierna nad Tisou in Czechoslovakia and to Zahony in Hungary, both of which also have extensive trans-shipment facilities. The main trans-shipment facilities between the USSR and Rumania, between Galati (Rumania) - Reni (USSR) and Iasi (Rumania) - Ungeny (USSR) are both through the Moldavian SSR, although they must pass into Ukrainian territory to reach the more developed parts of the country. There are several other border crossing points in the western Ukraine between Chop and Chernovtsy, none of which seem to have very extensive trans-shipment facilities or a large volume of traffic.

Generally speaking, there are two areas of vulnerability along the Soviet borders. The easternmost consists of a series of steep grades, sharp curves, defiles, and tunnels through the Carpathian Mountains, which, in addition to presenting physical vulnerabilities, also greatly reduce the maximum capacity of several rail routes. The westernmost zone of vulnerability, found on every line presently used, consists of the trans-loading facilities at the borders and often on both sides of the border. At many points along the border, there are parallel standard-gauge and broad gauge tracks with trans-shipment facilities at one or more points along these parallel sectors. The limitations of these trans-shipment facilities could be overcome in a serious emergency by utilizing large amounts of unskilled labor to transfer freight between trains at any point along the parallel standard and broad-gauge tracks. The bottleneck aspects of trans-shipment installations should therefore not be over-emphasized. There are a number of rail connections between the Ukraine and the



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European satellites which are not being used but which could be operated or made operable if necessary. The combination of trans-shipment needs and the low capacity of Transcarpathian rail lines constitute a potential traffic bottleneck and therefore a major vulnerability.\*

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\* Information sufficiently detailed to determine the potential trans-shipment capacity and the extent to which it is a bottleneck is not available. What is needed in addition to information on the capacity of the main trans-shipment facilities is accurate knowledge of the number of sidings available along parallel standard and broad-gauge tracks, and information on the extent to which standard-gauge tracks in Soviet territory have been removed. Much of the standard-gauge trackage in the former Polish, Czechoslovakian, Hungarian, and Rumanian territory has been reported dismantled although some may still be in place and provide therefore additional trans-shipment space. It is also important to know whether the rail lines on the Soviet side or on the Soviet side of the border have a higher overall capacity. On this point it seems clear that rail lines on the Soviet side leading from the border have a lower capacity and would therefore be the logical targets for interdiction.

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c. Water Transportation<sup>3</sup> (See Map S)

## (1) Inland Waterways

In spite of perennial efforts to increase the share of long-distance transport carried by inland waterways, these still play an insignificant part in the over-all transport picture of the USSR, timber excepted. Since the Ukraine is not an important timber area and is well served by railroads, navigable rivers carry only a very small percentage of annual freight tonnage. The total for 1955 was 3.2 billion ton kilometers. For this reason waterways should be considered in terms of their planned and potential capacity rather than in terms of the traffic currently waterborne. Only a small fraction of the existing capacity of the Ukrainian waterways is being utilized. There is no information on the portion of the Soviet river fleet operating in the Ukraine proper, but there is no reason to believe that the situation in the Ukraine differs from that of the Soviet Union as a whole. The river fleet is not being fully utilized and therefore does not constitute an immediate bottleneck for traffic expansion. Since the Ukraine has considerable ship-building capacity, including a number of yards specializing in barges, tugs, and other small vessels used in inland waterways, the river fleet could be considerably expanded. It would also be feasible to transfer rather quickly numbers of tugs and barges to the Ukraine from other regions of the USSR and from Soviet Bloc countries. Granting the possibility of large-scale and rapid expansion of the river fleet, the ultimate capacity of the main rivers will be limited by the capacity of navigational locks whose dimensions limit the size of vessels and barge-trains and whose speed of operation limits the number of vessels which can pass in one day.

Ukrainian waterways suffer under the same handicaps which afflict waterways throughout most of the Soviet Union. These include a closed season during the winter, which increases toward the east; periods of low water during the summer drought, which have been eliminated along some sectors where water levels are maintained by large reservoirs; and

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the perennial problems of how to maintain adequate channel depth. The flat nature of most of the Ukrainian landscape and the consequently meandering course of the rivers and their slow currents aggravate the problem of dredging.

The Dnieper River is the only significant navigable waterway in the Ukraine. Through its tributaries and through canals it is connected with the waterway systems of Central and North European Russia, the Volga, and Poland. It is connected with the Polish Vistula River by means of its left bank tributary, the Pripyet, and the Vistula tributary, the Bug. The Dneprovsko-Bugskiy Canal connecting the Pripyet and the Bug, with a large number of locks which can only take 200-ton barges, is being modernized. The Dnieper is connected with the Niemen (Nemunas) River and the Lithuanian SSR by the obsolete Oginskiy Canal whose present status is unknown. The Dnieper is connected with the Western Dvina River emptying in the Gulf of Riga by the Berezinskiy Canal, also obsolete and in unknown condition. The connection between the Dnieper and the Volga Rivers is made via the Desna, a Dnieper River tributary, and the Oka, a Volga River tributary. Only the Upper Dnieper-Bug-Vistula connection is believed to carry any substantial amounts of freight, mainly agricultural products and timber. The 1940 plan called for shipment of nearly 2,000,000 tons between the Upper Dnieper and the Upper Dvina Rivers. The only other figure obtained for inter-river shipment refers to the Dnieper-Bug connection, also in 1940. The plan for that year specified 719,000 tons. The bulk of the traffic carried by the Dnieper River moves in its lower reaches. Principal ports are Kiev, Zaporozhye, Kherson, Dnepropetrovsk, and Kremenchug. The plan figure for 1940 was 5,385,000 tons for the Lower Dnieper. (The Lower Dnieper is generally defined as that sector from its mouth to Zaporozhye, but since sources for this figure and for the above-mentioned data on the Dnieper connections do not give tonnage for the Middle Dnieper, it may be that the total given refers to the Middle Dnieper as well). Traffic is somewhat greater today; in 1956 the port of Kiev alone handled 3.5 million tons of freight. The main items carried on the Dnieper are construction materials, timber, coal,

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grain, and crude oil. The crude oil nearly all goes upstream from the Black Sea-Dnieper River trans-shipment port of Kherson. Much of the grain probably moves downstream and is exported to the European satellites. Timber moves downstream from the forested areas of Belorussia and Central Russia. The total traffic borne by the Dnieper at present probably does not much exceed the plans for 1940. Since these include shipments traveling both on the Lower Dnieper and on various connections between the Dnieper and other waterways, they cannot be added without duplication. The volume is no more than would be carried by a single-track rail line of only moderate traffic. The navigation season averages 270 days above Zaporozhye and somewhat longer below Zaporozhye. The controlling depth of the Dnieper River is 2 meters from Kherson to Zaporozhye.

A channel taking vessels of 6 meter draft connects Kherson to the Black Sea. With the completion of the Kakhovka hydroelectric power plant and reservoir in this sector, the minimum depth will be raised about 3 meters. Above Zaporozhye the controlling depth is 3 meters as far upstream as the Pripyet River. With the completion of the Kremenchug and Dneprodzerzhinsk dams and reservoirs, scheduled for the 1956-1960 plan period, 3,000-ton barges will be able to navigate the Dnieper to Kanev. The Zaporozhye dam and navigational lock, and, in the near future, the Kakhovka dam and navigational lock, are vital for maintaining navigation on the river, particularly during the dry season. Destruction of the dams and associated structures, in addition to their consequences for navigation and for power generation, would also have serious effects on agriculture since releasing the waters from the reservoirs would flood extensive areas and since these waters are used in part for irrigation. When the Kakhovka reservoir is filled, it will have a sufficiently high water level to flood the manganese mines of Nikopol' and the city of Nikopol' itself. Extensive dikes have been constructed to retain the waters of the reservoir which could be breached with disastrous results at many points.

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The Dnestr River rises in the Carpathian Mountains, crosses the Moldavian SSR, and empties into the Black Sea not far south of Odessa. At present the water levels in this river are uncontrolled, but two hydroelectric projects under construction will eventually regulate it. One of these, Dubossary, is located in the Moldavian SSR. The other, Mogilev-Podolsk, is in the extreme western part of the Ukraine. The Dnestr is navigable as far upstream as Khotin. From this point to Yampol the minimum depth is only 1 meter; downstream from Yampol the minimum depth is 2 meters. Freight on this river is mainly timber and agricultural products. Total volume is unknown but fairly small. Cargo turnover in 1955 was 2.4 times that of 1950. There are no major shipbuilding or ship-repair facilities on this river. It has no connections with other waterways and drains a sparsely populated and under-developed region. The navigation season averages 285 days a year.

The Donets River, a tributary of the Don River, is navigable as far upstream as Veselogorsk in the eastern Donbass. Navigation in the upper reaches of the river is limited to drafts of 1 meter. Very little traffic moves in the Ukrainian sector of the Donets. The bulk of freight is borne on the downstream sector from Mikhaylovka to its junction with the Don River. This entire sector lies beyond the borders of the Ukraine. The principal items are coal, iron, steel, heavy industrial products, and timber. An average navigation season lasts 260 days.

Boat-building and repair yards for the river fleet are located at Kherson, Dnepropetrovsk, and Kiev, all on the Dnieper River. Kiev has extensive boat-building facilities; its products include sea-going trawlers as well as a wide variety of river vessels. The Ukrainian river fleets receive regular increments from the East European satellites.

Two important canals are under construction whose main purpose is water supply which may possibly also be used for navigation. The first of these is the South Ukrainian-North Crimea Canal.<sup>4</sup> It originates on the Dnieper River at Zaporozhye and mainly follows the course of the Molochnaya River to the

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vicinity of Melitopol'. Here a dam impounds a reservoir with a capacity of 6 billion cubic meters. The dam is equipped with a navigational lock. A branch goes east from here to the area of Osipenko. The canal is joined by another branch originating in the Dnieper River at the Kakhovka reservoir known as the Krasno-Znamenka Canal. It crosses into the Crimea by way of the Perekop isthmus and continues along the north shore to Kerch'. Kerch' has depended in the past for water on seaborne shipments from the Caucasus. The canal will provide irrigation for thousands of hectares and will have at least one power plant, located at the dam near Melitopol'.

A second canal under construction originates on a tributary of the Severnii-Donets River and supplies water to various cities in the Donbass, terminating near Stalino.<sup>5</sup> Numerous side canals and pipelines will carry the water to various cities along this route. Since the origin of the canal on the Oskod River is nearly 200 meters lower in elevation than the terminus, very large pumping facilities are required, including at least four pumping stations. There is no information on navigational facilities or plans, although the volume of water to be pumped by this canal seems sufficient to permit navigation of sizeable barges.

A canal from Krivoy Rog to the Dnieper River below Nikopol' is still in the planning phase.<sup>6</sup> Its purpose would be threefold: water supply for the growing industrial center of Krivoy Rog, irrigation, and water transportation of iron ore to the Dnieper Bend steel plants, and eventually to the Donbass via the South Ukraine-North Crimea Canal and the Sea of Azov.

## (2) Maritime Transportation:

Comprehensive information on the maritime traffic on the main Black Sea ports dates back to the 1930s. In that period all the Black Sea ports were almost exclusively export centers with only Odessa having any substantial volume of imports. (By export and import is meant domestic trade along the Caucasus and North Caucasus as well as international trade.) This picture is believed to have altered considerably

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since the war due to substantial imports from the East European satellites, and particularly oil from Rumania. Information is available on the 1951 transport plan for the Black Sea State Dry Cargo Steamship Company. A total of 9,000,000 tons of freight were scheduled for transport between domestic ports, of which the largest items are as follows:

	Million Tons
Coal	1.2
Machinery and equipment	1.2
Processed Metals	1.
Construction materials	1.
Timber and lumber	.8
Grain	.8
Cattle, wool, hemp, etc.	.8
Cotton	.6
Manganese Ore	.6
Iron Ore	.5
Foodstuffs	.5

The main destination of the manganese ore, which comes from the Caucasus, is Zhdanov, Osipenko, and Odessa. Cotton, which also originates in the Caucasus, goes mainly to Odessa in the Ukraine and Rostov in the RSFSR. Grain is shipped from Odessa and from Novorossisk (in the North Caucasus) to all other Black Sea ports. Timber and lumber, which are shipped down the Dnieper and Don Rivers to the trans-shipment points of Kherson and Rostov, are shipped to all other Black Sea ports. The main origins of foodstuffs other than grain are the Caucasian Black Sea ports and the Crimean ports of Feodosiya and Kerch'. Metal products are shipped from Zhdanov and Osipenko to the Caucasus and to Nikolayev and Odessa. Construction materials, including cement, are shipped from Rostov and Novorossisk to Kherson (for the Kakhovka hydroelectric project) and to other ports along the Ukrainian and Crimean coasts. Machinery and equipment is shipped from Odessa, Nikolayev, and Zhdanov, and Rostov to all other Black Sea ports.

Oil and petroleum products are by far the largest item in Black Sea traffic. The Sovtanker 1951 transport plan called for the shipment of 2.5 million tons of oil and petroleum products, of which 1.6 million tons originated in the Caucasus area and was sent to Odessa. The total of 2.5 million tons does

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not include large amounts shipped from Constanta to Odessa. Smaller amounts of oil and petroleum products go mainly from the Caucasus to other ports on the Crimean Black Sea coast and on the Sea of Azov.

The largest port on the Black Sea is Odessa, with a military port capacity of 18,000 to 20,000 long tons<sup>\* 7</sup>. Its main imports are oil and petroleum products and its principal export is believed to be grain. The port is open all year, although icebreakers are needed during the winter. The second largest port in the Ukraine in terms of general cargo-handling capacity is Nikolayev, with a military port capacity of 10,000 to 11,000 tons. It exports grain, iron ore and manganese ore, and imports petroleum products, machinery and foodstuffs. Zhdanov is the largest port on the Sea of Azov, with a capacity of 9,000 to 10,000 tons. It is usually icebound from December to March but a channel is kept open by icebreakers. It imports iron ore from Kerch', fish and agricultural products mainly from the Crimea and the Ukraine, and oil from the Caucasus. Its main exports are Donbass coal and agricultural products. Smaller ports along the southern shore of the Ukraine include Kherson, with a capacity of about 3,000 tons, and Osipenko, with a capacity of 2,300 to 2,600 tons a day. In addition there are a number of ports in the Crimea, of which Kerch' has a capacity of 4,000-4,500 tons of general cargo. Its main exports are iron ore, fish, and construction materials, and its main imports are coal and oil. It is possible that the military port capacity given above does not include the large facilities south of Kerch' for loading iron ore destined mainly for Zhdanov. It is also possible that Zhdanov's port capacity does not include specialized ore-handling facilities. Feodosiya, with a port capacity of 3,800-4,000 tons, is primarily an export center for Crimean agricultural products. Yalta, a main Crimean resort center, with a port capacity of 1,100 to 1,200 tons, mainly imports foodstuffs and miscellaneous products. In addition to these

\* Military port capacity refers to general cargo handling capacity for a 20-hour day, and does not include specialized facilities such as oil-pumping equipment.

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three Crimean ports is the large naval base of Sevastopol', the largest and best naval harbor in the Black Sea. No figures are available for its general cargo-handling capacity but there is no doubt that it has substantial capacity probably well exceeding that of all other Crimean ports.

The utility of the Crimean ports is limited by the fact that all of them depend upon the same two single-track rail lines crossing at Dzhankoi, which limit the potential capacity of the Crimea as a whole and render its port facilities quite vulnerable to indirect interdiction.

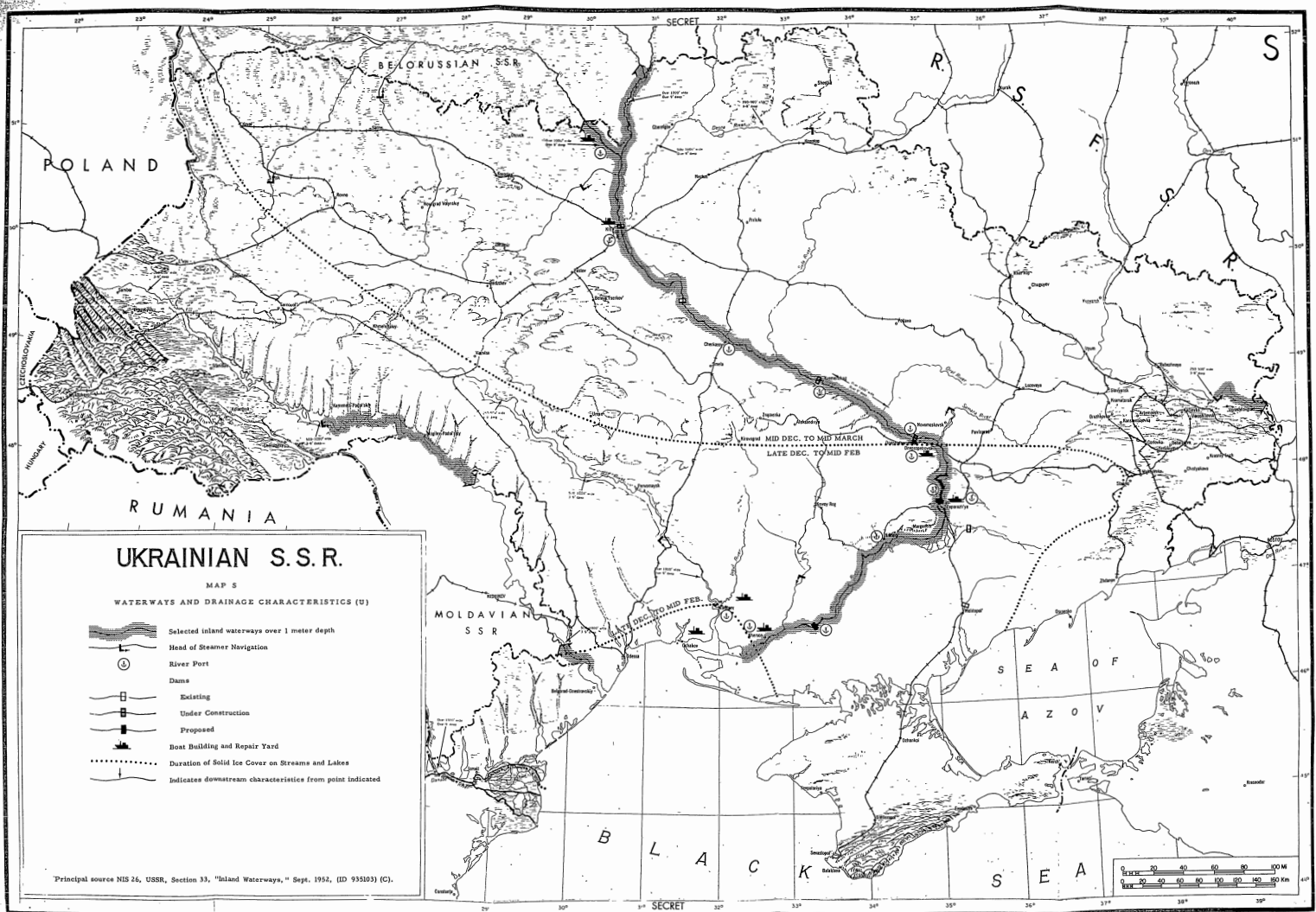
The Soviet flag merchant fleet on the Black Sea constitutes roughly 20 per cent of the Soviet flag merchant fleet. It is subject to change on fairly short notice by a transfer of ships to and from other areas. It is also subject to increase through the rather considerable shipbuilding facilities in the Black Sea which constitute perhaps one-third of total Soviet shipbuilding facilities. Detailed information is available on composition of the fleet in 1951.<sup>8</sup> It included the following oil tankers--three large diesel-powered tankers of 5,000 to 8,000 tons apiece; ten smaller diesel tankers of 3,000 tons apiece; three old small diesel tankers of 1,500 tons each; and four old steam engine tankers displacing 5,000 tons each. In addition to tankers Sovtanker had about six lighters displacing about 6,000 tons apiece which were old steamships with engines removed. Repair and maintenance work on Sovtanker ships was done mainly at Tuapse on the Black Sea coast of the Transcaucasus. The dry cargo fleet included three large diesel-electric ships, two with 25,000 tons displacement and one with 15,000 tons displacement; ten diesel-powered combination freight and passenger ships of 10,000 to 12,000 h.p. which had been received as reparations following the second World War; about 40 diesel-powered ships ranging in size from 3,000 to 8,000 tons and constructed between 1928 and 1938; and about 20 diesel-powered freighters slightly over 1,000 tons each. In addition to the diesel-powered ships, the Soviet dry cargo fleet in 1951 included about 60 coal-burning ships displacing 2,000 tons apiece, and about 12 lighter and barges of 1,600 to 3,000 tons. The Soviet Black Sea merchant fleet also disposed of five ice breakers and

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ten tug boats. Odessa was the main center for ship maintenance and repair, but other ports in the Ukraine including Nikolayev' and Zhdanov as well as Black Sea ports in the Caucasus were also used.\*

The largest shipbuilding facilities in the Black Sea are located at Nikolayev'.<sup>9</sup> The main activities of the two shipyards employing a total of 18,000 workers is the construction of large warships. Construction of freighters is increasing, with at least three diesel-electric cargo vessels of 5,000 tons displacement completed in 1956. Three shipyards in Odessa and vicinity are primarily engaged in ship repair, the Marti being the largest ship repair center in the Black Sea. The Kherson shipyard is also engaged in construction as well as in repair of merchant vessels. Its main products are diesel-powered tankers. At least three tankers of 10,000 tons displacement each and one of 16,000 tons were completed in 1956. Kherson also constructs tugs and steam generators. The Sevastopol' navy yard is the main naval repair yard in the Black Sea area. It also has facilities for construction of destroyers, submarines and smaller naval vessels. There is no information on construction of merchant vessels. Smaller shipbuilding yards are located at Zhdanov and Kamysk Burun. Zhdanov engages in the construction of freighters, small vessels, and boilers. Kamysk Burun builds barges and small naval vessels.

\* These figures are much larger than those reported by NIS 26, Sec. 38, Merchant Marine; NIS listed only 55 vessels of over 1,000 tons apiece, including 33 freighters, 10 tankers, and 12 combination freighter and passenger vessels.





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d. Highways<sup>10</sup> (See Map T)

Highways as a means of transport are not comparable to railroads and waterways whose functions are principally middle and long-distance freight movement. They are essentially local routes connecting nearby cities and linking cities with their rural hinterlands. In 1955 a total of 687.4 million tons of freight were trucked on Ukrainian roads; the average length of haul was 10.6 kilometers. Long-distance routes are few and are not sufficiently interconnected to be called networks. In the Ukraine the only good through routes completed are the Moscow-Kharkov-Crimea highway and the Kiev-Kharkov-Rostov highway. An inter-republic highway route which is completed from Leningrad on the north past Kiev on the south will be extended to Odessa in the current five-year plan. Two connections between the north-south highways originating respectively at Leningrad and Moscow will be constructed during the current plan period. The northern connection will start at Lemeshevo on the Leningrad-Kiev route and terminate north of Kursk on the Moscow-Crimea route. The southern route will link Kiev and Dnepropetrovsk. Well-developed highway networks intermediate in function between the local systems found throughout the Ukraine and the national network still in the planning stage are found only in the western Ukraine. The former Polish areas had a well-developed network of all-weather routes, most of which were gravel surface but some of which were paved. The highway from Kiev to Rovno, where it branches northwest to Brest and southwest to L'vov, is of Republic importance. The Ukraine in 1955 had 37,600 kilometers of surfaced roads, nearly all gravel or crushed rock. Some of these roads have been allowed to deteriorate but the more important ones have been maintained by the Russians.

Within the pre-war boundaries of the Ukraine, the highway density is highest in the area to the west of Kiev, the most productive wheat-growing region of the USSR. The main function of the highway network here and, indeed, throughout most of the Ukraine is local collection of agricultural products and their transport to processing centers or to railroad dispatching

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points, as well as the local distribution of supplies to collective farms and small towns. The only other area in the Ukraine with a well-developed local net is at Donbass. Here the highways contribute to the local movement of construction materials and mining equipment, although their agricultural function is probably the most important. The highway network is least developed in the Lower Dnieper region near the Black Sea and the Azov Sea coasts, and in the extreme northwestern Ukraine along the borders of Belorussia. These are areas of sparse rural population density and a low proportion of agriculturally useful land.

Local road networks are not physically vulnerable because there are so many roads and alternative routes that effective interdiction is impossible. Furthermore, frequently off-road movement is not much more difficult than movement on the roads. For the local movement of agricultural products to railroads and towns and of manufactured products to the farms, motorized traffic can be partially replaced by horse-drawn carts. Modern long-distance routes capable of bearing heavy traffic and crossing rivers on high-capacity bridges are more vulnerable physically, but since these routes are important in Soviet economic and military movement, their interdiction by Special Forces operations would prove of very limited value, except under very special circumstances.

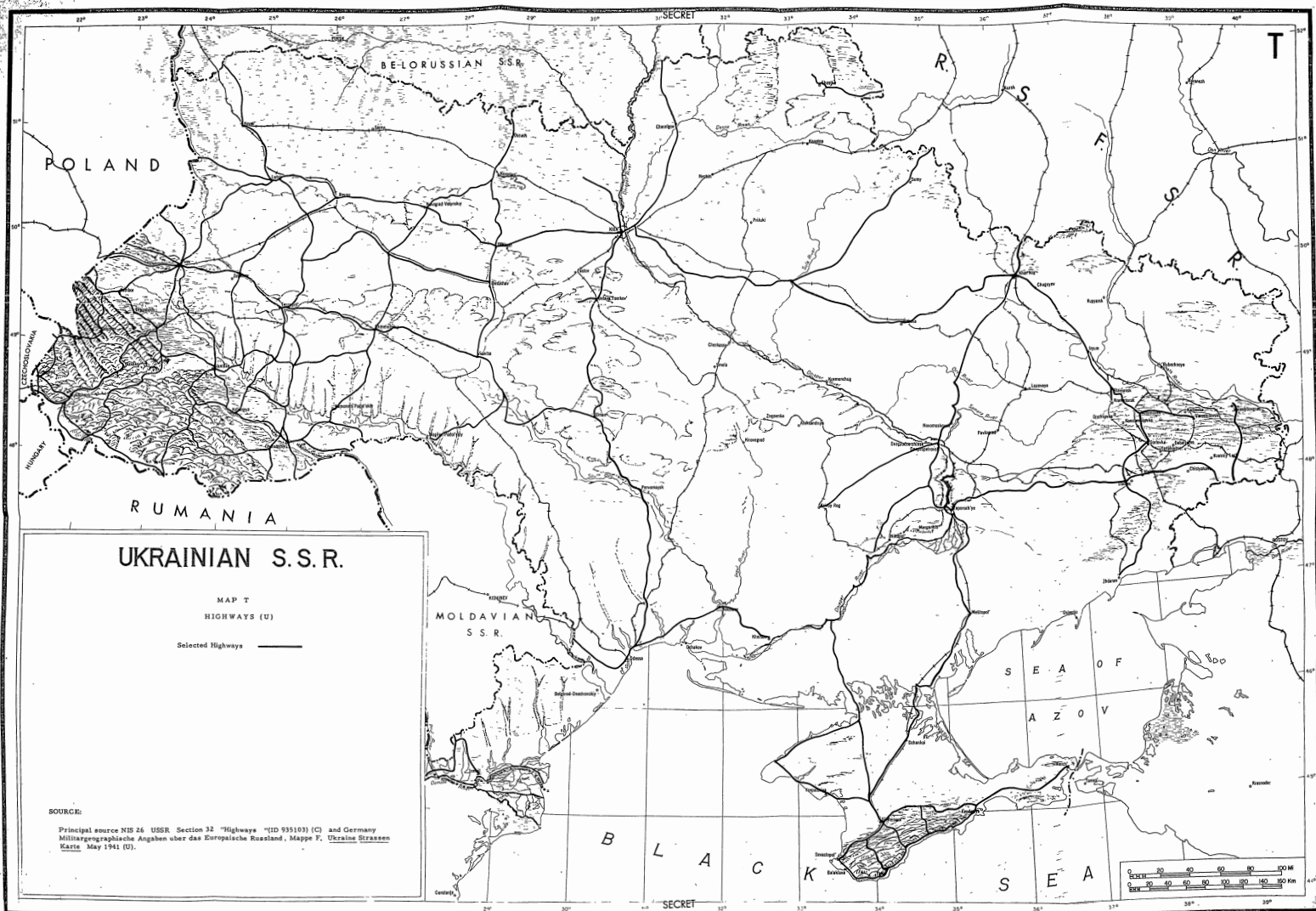
Only interregional road connections in areas lacking railroad transportation or with a very sparse rail net are likely to prove economically or militarily significant. In the Ukraine there are no points more than 35 kilometers away from a railroad line. The only area where highway capacity may possibly be a significant supplement to limited rail capacity would be along the western border of the Ukraine where rail lines connecting Russia with its satellites cross the Carpathian Mountains. Railroad capacity in this area is reduced because of difficult terrain and the rail lines themselves are very likely targets for interdiction.

Traffic density on even the most heavily traveled Russian highways is very low by American standards and certainly only a small proportion of

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roadway capacity. The real limit to highway traffic is imposed by the number of available motor vehicles, the ability to keep these motor vehicles in operational condition, and the supply of motor vehicle fuels. Neither the motor pools nor repair facilities are sufficiently concentrated to provide profitable targets. The supply of motor vehicle fuel is the most vulnerable point in highway transport. Motor vehicle fuel in the western Ukraine comes largely from the numerous small oilfield refineries along the Carpathian foreland and by rail from Rumania. The motor vehicle fuel supply in the eastern Ukraine comes mainly by pipeline and rail from the Caucasus; central Ukraine motor vehicle fuel comes from Rumania by pipeline and by tanker, and from the Caucasus by tanker and rail. Motor vehicle fuel moves north from the sea coast mainly by rail although some fuel flows up the Dnieper River. It may be concluded that the most effective way of interdicting highway transport is the interdiction of railroads and petroleum pipelines.

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3. Electric Power<sup>11</sup> (See Map U).

About 20 per cent of the total installed electric power capacity of the Soviet Union is located in the Ukraine. The great majority of the Ukrainian power plants, with over 80 per cent of Ukrainian power capacity, are coal-burning steam plants. Nearly all the hydroelectric capacity in operation and under construction is located on the Dnieper River. As new hydroelectric projects begin operation, their share in the Ukrainian power system will increase but there is no prospect that they will contribute a major share of power in the Ukraine.

Power plants are very unevenly distributed throughout the Ukraine. Most of the capacity is located in two areas, one of them being the Donbass, and the other being the Dnieper Bend area. This concentration of electric power capacity corresponds fairly closely with the concentration of power consumption. The largest consumer of power is the metallurgical and related industrial base of the Donbass and the Zaporozh'ye aluminum plant and other power-oriented industries along the Dnieper River.

The Dneproges at Zaporozh'ye (4749N-3511E) is the largest power plant in the Ukraine. Its capacity is 651,000 kw. but it is only able to operate at this maximum figure for 75 days during the year. The dependable year-round capacity is much smaller, between 200,000 and 300,000 kw. The Kakhovka (4650N-3330E) hydroelectric plant has recently begun operations. Its capacity is 250,000 kw. There is no information on whether this figure can be achieved on a year-round basis or not. The Kremenchug (4903N-3328E) hydroelectric plant is under construction but not yet operating. Its capacity will be 450,000 kw. Its tremendous reservoir which will reach up to Kanev' and can store 15 million cms. of water will contribute to stabilization of the power potential of Dneproges. Two other plants may be under construction on the Dnieper River, one of them at Kanev' (4945N-3128E) and the other near Kiev at the junction of the Dnieper and the Desna Rivers. According to some sources both plants are to be constructed during the current five-year plan; according to other sources, only the Kanev'

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plant will be constructed. In addition to these hydroelectric plants in operation, under construction, and projected, the Dnieper Bend area has one very large thermal plant of 198,000 kw. capacity located at Dneprodzerzhinsk (4830N-3437E) and a number of other sizeable coal-burning plants at Dnepropetrovsk, (4827N-3459E), Zaporozh'ye, and Krivoy Rog (4754N-3321E). The large Dneprodzerzhinsk thermal plant is very important to the system during periods of low water flow because of the reduced capacity of the hydroelectric plants.

The Donbass area has at least five plants of more than 100,000 kw. capacity. By far the largest is the Zugres plant at Zuyevka (4804N-3815E) with a capacity of about 350,000 kw. The Kurakhovka plant (4802N-3723E) west of Stalino has a capacity of about 200,000 kw. Very large plants are under construction and in partial operation at Voroshilovgrad (4834N-3920E) and at Verbinskiy (4753N-4002E). Each of these will have at least 200,000 kw. ultimate capacity. Other large plants include the Shter thermal plant (4805N-3855E) of 152,000 kw. and the Krasnyy Sulin plant (4755N-4006E) of 100,000 kw. Two of these plants, Verbinskiy and Krasnyy Sulin, are beyond the borders of the Ukraine.

Outside the Dnieper Bend and Donbass areas large concentrations of power are found in Kharkov and Kiev, each of which has at least four medium and large power plants. All the Kiev power plants burn coal presumably from the Donbass although some locally obtained peat may also be used. One of the large Kharkov plants has been converted to burn natural gas from Shebelinka (4927N-3631E). The others burn coal mostly obtained from the Donbass. Smaller concentrations of power capacity are found in the western Ukraine at L'vov (4950N-2400E) whose 60,000-kw. power plant burns natural gas from Dashava (4915N-2401E) and along the Ukrainian seacoast, particularly Odessa (4629N-3044E), Nikolayev (4658N-3200E), Sevastopol (4435N-3334E), and Zhdanov (4809N-3816E). All of these rely mainly on coal from the Donbass as fuel.

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Since the Donbass power plants are located in the heart of the coal-mining area and the main Dnieper plants except Dneprodzerzhinsk are hydroelectric, there is little prospect of interdicting power by means of cutting off supplies of fuel. Kiev and Kharkov depend mainly on Donbass coal and, in the case of Kharkov, on Shebelinka gas. Most of the other sizeable plants scattered throughout the Ukraine use coal from the Donbass, the main exception being L'vov. These plants are therefore subject to indirect interdiction through denial of their fuel supplies but, Kiev and Kharkov excepted, they do not comprise a large proportion of Ukrainian power capacity, nor do they supply many critical installations with current. The sea-ports and naval bases are in a less vulnerable position because they can obtain fuel either by land or by sea and because they can obtain current in emergencies from large units of the Soviet fleet or from specially equipped cargo vessels. Such floating power stations were used at the end of the Second World War to supply damaged Black Sea ports while their own power sources were reconstructed.

Regional networks of high tension lines are restricted to the Donbass and the Dnieper Bend areas. Transmission lines variously described as 110 kv. and 150 kv. radiate from the large hydroelectric plant of Zaporozh'ye on the Dnieper to Nikolayev on the Black Sea, to Krivoy Rog, to Dnepropetrovsk upstream on the Dnieper River, and to various other nearby cities. The Donbass is criss-crossed by 110-kv. lines and connected also by 110-kv. lines to large power plants in the Rostov oblast. The Dnieper and Donbass power systems are inter-connected by a 220-kv. line (possibly a double line). Within these systems the integration of power plants and the multiplicity of transmission lines makes interdiction through cutting transmission lines extremely difficult. On the other hand, a very large capacity in each system is concentrated in two or three plants, so that loss of any one of these large plants would be felt throughout the power network. High-tension lines linking these power systems to Odessa on the southwest,

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Kiev on the northwest, and Kharkov and Moscow to the north are planned but not known to be in operation. Elsewhere in the Ukraine power networks are limited to local distributing systems, usually of 35-kv. and lower capacity, plus a few short 110-kv. lengths connecting several power plants in the same general area.

There is no adequate information on the extent to which industrial plants in the Ukraine draw their current from the public network. There is also limited information on the availability of emergency or auxiliary power plants in vital industrial establishments which could be used to maintain operation should the public power supply be disrupted. Nor is there any information on the extent of connection between such industrial power plants and the general network, so that they might be used to make up for power loss throughout the system resulting from interdiction of a public power plant. The trend in Soviet construction has been to depend more and more on a few large public power plants with no provision for separate and higher-cost industrial installations.

Since the electric power network of the Ukraine is in the process of expansion and since a number of sizeable power plants are continually under construction, some conflicts between our principal sources are to be expected and most of these conflicts are probably the consequence of the differing dates of information. The main disagreements on electric power networks concern the connections between Kharkov and the Dnieper-Donbass network. The one source which states that Kharkov is linked with the Dnieper-Donbass network does not detail the location of the high-tension lines.<sup>12</sup> It would be reasonable to have a high-tension line either to the Dnieper Bend around Dnepropetrovsk or to the Donbass, possibly at Lisichansk. In the future probably both connections will exist but the present status is unknown. One source claims that Odessa is linked with the Dnieper area<sup>13</sup>, probably by way of Nikolayev, although other sources list such a connection merely as planned. Definitely in the planned stage is a connection between the Dnieper Bend power system and

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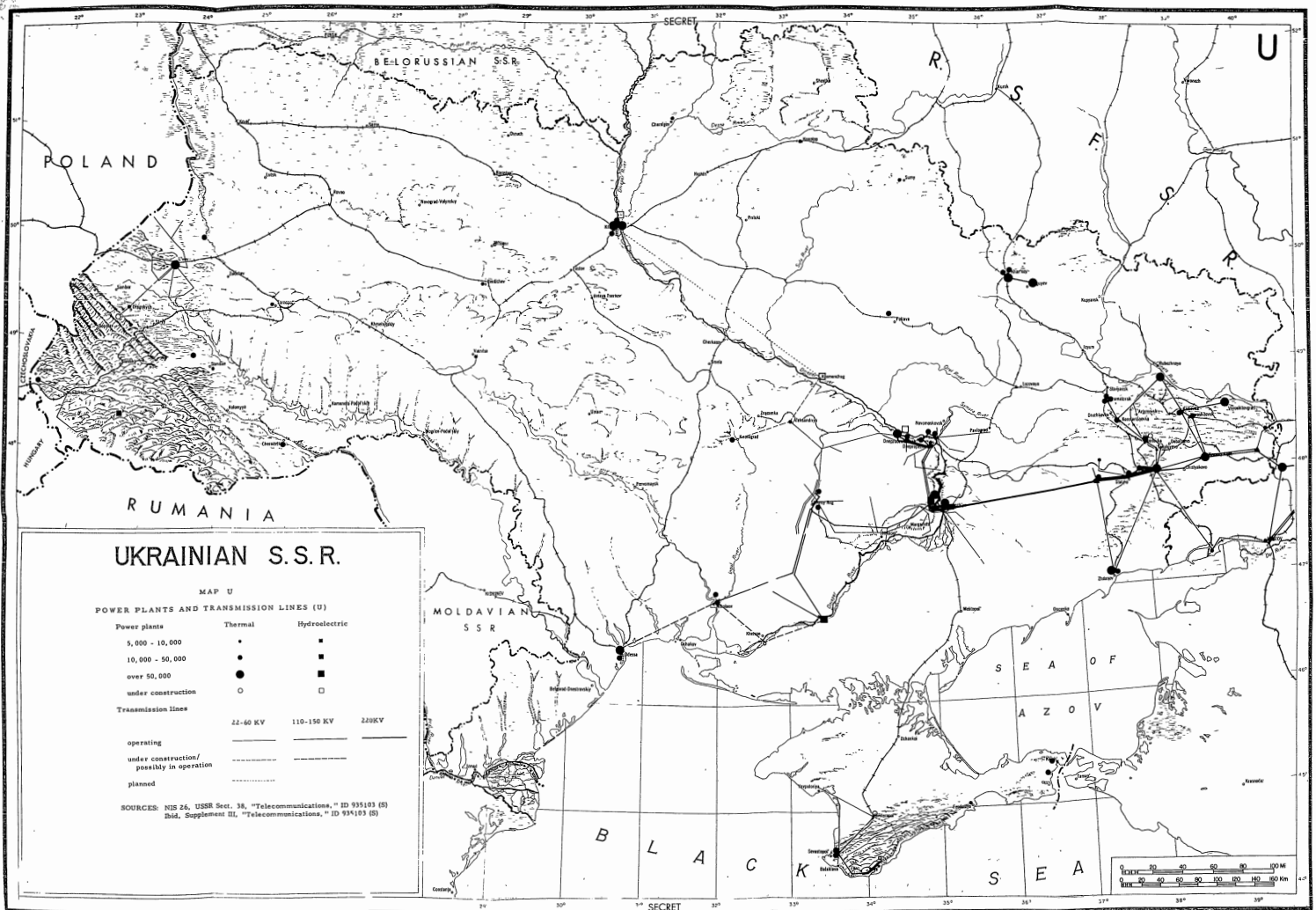


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Kiev which will probably be through the Kremenchug hydroelectric plant now under construction. The connection between Kiev and L'vov seems to be in the more remote future. Listed among definite plans but merely mentioned by an authoritative source as a probable development is a line from the recently completed Kakhovka hydroelectric project on the Lower Dnieper to the Crimea. This last connection would probably go to the Kerch' Peninsula, which is being expanded as an iron ore mining and processing center. The disagreements on size of power plants are in most cases not very serious and will be covered in detail whenever the power plants concerned fall within a Special Forces Area. More serious are disagreements on the number and operational status of power plants. As a consequence of a dearth of post-war information in some areas, power plants and their capacities as reported by some sources are believed to have reference to the pre-war period. Since this entire area was overrun by the Germans in World War II, such pre-war information is only of value in the absence of more recent data. A number of plants have not been shown on the map because information on them is of wartime date and there is no assurance that they have been reconstructed. Industrial power plants which do not normally contribute to the general network are only incompletely reported. A great majority of these plants are too small to be considered.

An arbitrary minimum size of 5,000 kw. was selected for power plants included in this report. Few significant industrial installations would be exclusively dependent on power sources of lesser capacity. Power sources of this size and smaller can quickly be replaced by mobile power plants in case of need. In areas served by a well-developed power network loss of 5,000 kw. capacity or less would not have serious consequences and it may be argued that a larger minimum size should be selected for the Donbass and Dnieper Bend areas. Along the seacoast even sizeable power plants may prove to be expendable because of the possibility of utilizing large naval vessels or specially-equipped cargo ships as floating power plants.

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4. Minerals<sup>14</sup> (See Map v )a. Coal and Coke<sup>15</sup>

The Donets Basin is the Soviet Union's most important coal mining area both in terms of total output and of its proximity to the population centers of European Russia as well as of the iron ore, limestone, and manganese required for the manufacture of steel. The coal basin covers an area of about 25,000 square kilometers. The best quality coking coal is found in the western and northwestern parts of the basin whereas anthracite is found mainly in the eastern and southeastern parts. Total production of the Donbass reached 85,000,000 tons in 1939 and, after a period of reconstruction in the years immediately following the second World War, exceeded its previous level of production, attaining 116 million tons in 1955. Before World War II there were 314 "basic" mines (with an annual capacity exceeding 20,000 tons) as well as many smaller mines. Most of the mines were seriously damaged but were rehabilitated shortly after the war. A number of new mines have been opened and other large mines are under construction. In spite of increasing production, Donbass coal has a declining share of USSR output: three-fifths of the total before the war, but no more than 32 per cent in 1955 and probably at present.

A substantial proportion of coal mined in the Donbass is used locally in the manufacture of metallurgical coke, as a raw material for the chemical industry, and as the main source of fuel for electric power generation, heating, and railroad operation. The greater part of the Donbass output, however, is shipped out, much of it going north to Central Russia. Donbass coal is essential for the metallurgical industry in the Moscow area and important for the metallurgical industry in the Urals, although the Urals can also obtain coal and coke from Karaganda and the Kuzbass. In the years just before the second World War as much as 40 per cent of the Donbass coal produced was shipped to RSFSR. There are no recent data on the proportion of coal shipped beyond the confines of the Ukraine, but since on the whole the expansion of the main coal-consuming industries in the Ukraine has exceeded the

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expansion of Donbass coal production, it is likely that a smaller percentage is shipped out.

Most of the coal seams of the Donbass are less than 1.5 meters in thickness and mined at depths of 200 to 500 meters. The preparation of an area for coal mining is therefore a major undertaking and coal mines tend to be large and highly mechanized in their operations. The most important mining regions in the Donbass are: Kadiyevka (Sergo), Gorlovka, Grishino, Lisichansk, Stalino-Makeyevka, Krasnyy Luch, Sverdlovsk, Mospino, Chistya Kovo, and Snezhanskii.

Other coal deposits in the Ukraine, mainly lignite, are much smaller and little exploited, their total output in 1955 amounting to ten million tons. Lignite deposits in the Dnieper Bend area are being mined near Aleksandriya (4840N-3306E), which has a briquetting plant, and Yurkovka (4901N-3015E). Over six million tons were mined in Kirovograd oblast in 1955. A small lignite mine is in operation at Beshuyskiye Kopi (4513N-3346E) in the Crimea near Yalta. Hard coal deposits in the L'vov-Volynskiy area are being mined near Dobrotvury (5013N-2422E) and possibly at other places. The importance of these mining operations is local. Exploitation of lignite and also of peat deposits in the western Ukraine is to be considerably expanded, eliminating the need for long hauls from the Donbass. The main peat workings are northwest of Kiev and near Smela (4914N-3125E). The total production of peat was 4.1 million tons in 1955.

There are at least 26 coke plants in the Ukraine, out of a total for the USSR which was estimated to number about 35 plants some years ago. They contribute about half the Russian output of coke. Most of the Ukrainian plants are in the Donbass proper, particularly in its western part, near the sources of the best coking coal. Most steel plants have their own coke ovens. Outside the Donbass there are several plants in the Dnieper Bend area, including Krivoy Rog, Dnepropetrovsk, Dneprodzerzhinsk, and Zaporozh'ye (two plants, one of which is a coke-chemical plant). There are two plants in the Zhdanov (Mariupol') area (including one at Primorskoye (Sartana) (4711N-3742E), of which one is a metallurgical coke plant and the other a chemical coke plant. Another metallurgical

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coke plant is located at Kerch' and a chemical coke plant is found at Khar-kov. All the coke used in the Ukrainian metallurgical industry is derived from Donbass coal. Some coke is shipped north to the Moscow area and possibly northeast to the Urals, but the quantity shipped is not known. The Moscow area has poor local sources of coking coal and no practical alternatives to imports from the Donbass, inasmuch as it is too far removed from Vorkuta on the north and the Asiatic sources (Karaganda and the Kuznets Basin) to the southeast.

b. Iron Ore<sup>16</sup>

The greater part, possibly two-thirds, of the Soviet Union's measured reserves of iron ore are found in the two deposits of Krivoy Rog and Kerch'. The Ukraine produced 55.6 per cent of Russia's iron ore tonnage in 1955 (probably an even higher percentage in terms of iron content).

The Kerch' reserves, covering 2,000 square kilometers and ranging in thickness from two to 20 meters, are the largest measured reserves in the Soviet Union. They have not been greatly exploited so far. Output of ore in 1950 was 2,000,000 tons and expansion to 10,000,000 tons a year was planned. Most of the Kerch' ores go by water to the steel center of Zhdanov on the shore of the Sea of Azov. If ore output is expanded as planned, it will far exceed the productive capacity of Zhdanov and will therefore find other destinations. Kerch' iron ore is not very rich, its iron content averaging about 35 per cent. It is difficult to process because of numerous impurities, including phosphorus. It has a considerable vanadium content and is used at Zhdanov to produce vanadium steels. The Zhdanov steel complex is the only one in the Soviet Union known to use the basic method of steel production. The Thomas slag obtained as a by-product is an important source of phosphate fertilizers.

All mining in the Kerch' area is open pit and conducted by mechanized equipment. The ore is concentrated and sintered at Kamysh Burun, which is near the center of current mining operations, to raise its iron content preparatory to shipment.

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By far the most important iron ore mining area in the Soviet Union is located in the vicinity of Krivoy Rog. The deposits cover an area 80 kilometers long and three to six kilometers wide. Total production reached 19,000,000 tons of ore just before the onset of World War II and in spite of the destruction of Krivoy Rog's 77 mines was quickly restored, exceeding 20,000,000 tons in 1950. In 1955 nearly 40 million tons of iron ore were mined in the Ukraine, mostly at Krivoy Rog--55.6 per cent of total USSR output. Production has risen due to improvement of mining equipment and expansion of mining operations to lower-grade ores, as well as construction of new mines.

The greater part of mining operations is underground, at an average depth of 150 meters, where the better grades of hematite, ranging from 60 to 70 per cent, are found. An increasing proportion of Krivoy Rog ores is being treated prior to reduction in blast furnaces because of resort to deposits of lower iron content and also because of the unsatisfactory mechanical characteristics of a powdery ore which requires agglomeration. The increasing depth of higher-grade ores and the increasing proportion of fines has led to exploitation of lower-grade ores by strip mining methods. Enormous amounts of ore containing less than 48 per cent iron are found on the surface.

Underground water is a serious problem in mining operations. Plans have been announced for diverting the Saksagan River through a six-kilometer concrete-lined underground channel but progress on this project is unknown. Some of the mines are very large. The Proletarskaya mine produced three million tons of ore a year before the war, and one of the new mines has a capacity of 15,000 tons a day. The high degree of mechanization, the necessity for pumping, and the large size of some mines render underground operations in Krivoy Rog physically vulnerable. Ore-concentrating and agglomerating facilities and the ore-sorting and distribution point at Verkhovtsevo 4829N-3414E (which handles 80 per cent of Krivoy Rog output) are other points of high vulnerability.

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Nearly all of the iron ore used in the Donbass and other steel plants in the Ukraine comes from Krivoy Rog. The Ukraine in 1955 produced 50 per cent of the USSR's pig iron (16.6 million tons) and 37.4 per cent of its steel (16.9 million tons). Substantial amounts of Krivoy Rog ore are shipped mainly by rail to the East European satellites. Poland imported about 3,000,000 tons in 1955 and East Germany, Hungary and Czechoslovakia obtained smaller but substantial amounts. These iron ore exports are vital for the operation of the metallurgical industries of the European satellites. Poland, for instance, must import 80 per cent of its iron ore, nearly all of it from the Soviet Union. Large amounts of Krivoy Rog ore are shipped to the steel plants of Central Russia and considerable amounts may now be shipped also to the Urals, whose local sources of iron ore are heavily depleted, and whose alternative sources of supply are in distant locations. It is expected that in the future increasingly large amounts of Ukrainian iron ore and Ukrainian coke will be shipped to the Urals because the Urals have a very large steel-making and steel-processing plant but insufficient and depleting nearby sources of raw materials for steel making.

Considerable steel-making capacity has been constructed in the neighborhood of the Krivoy Rog mines in order to utilize the return trip of freight trains carrying ore to the Donbass. These trains, which formerly returned empty from the Donbass steel plants, now carry coal and coke to Krivoy Rog and Dnieper Bend steel plants at Dneprodzerzhinsk, Dnepropetrovsk, and Zaporozh'ye. The availability of large amounts of cheap hydroelectric power has been a further factor in localizing part of the steel industry west of the Donbass. The Zaporozh'ye plant may be Russia's largest producer of electric furnace alloy steels. Steel plants utilizing Kerch' ore are located at Zhdanov and Kerch'.

c. Manganese<sup>17</sup>

The largest reserves of manganese ore in the world are found both northwest and northeast of Nikopol' on the west bank of the Dnieper River.

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These mines, formerly the main source of manganese in the Soviet Union, were heavily damaged during the war and took second place to Chiatura in the Transcaucasus. The 1950 production plan, which was fulfilled, specified an output of 2,000,000 tons of ore for Chiatura and 1.1 million tons for Nikopol'. These two deposits jointly account for well over four-fifths of the total Soviet manganese production. Most of the large Soviet exports of manganese ore come from Chiatura so that Nikopol' may provide half of the domestic consumption. Since the requirements for manganese ore are roughly proportional to the output of pig iron and steel, and since the output of pig iron and steel has nearly doubled since 1950, it is presumed that the output of Nikopol' ore has also increased greatly. New mines have been opened and more are under construction.

The ore is found in two deposits 10 to 15 miles apart which jointly cover an area of 275 square kilometers. Nikopol' ore has an average manganese content of 23 per cent. It is concentrated at five or more plants in the mining area, of which the central concentrator at Nikopol' proper has a capacity of 350,000 tons of ore and each of the others 200,000 tons a year. Only a fairly small proportion of the manganese ore is used as an alloying agent for special steels. The greater part is used in the making of pig iron, being added to the blast furnace charge for the purpose of oxidizing the sulfur found in Donbass coke and improving the fluidity of the slag. Most of the manganese is run off with the slag. Estimates of the ratio of manganese to steel output range from 33 to as high as 53.6 kilograms per ton. The latter figure is for the Ukraine only; estimates for other regions are lower. Because of its abundance manganese is widely used as a substitute for other alloying agent.

There are four principal steel plants in the Ukraine producing ferromanganese and other manganese-bearing alloys. Two of these are in the Donbass proper (Makeyevka and Konstantinovka), which use both Nikopol' and Chiatura ore; the other two, in the Dnieper Bend area, Zaporozh'ye and



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Kichkas (4753N-3505E), use only Nikopol' ore. Some of the Nikopol' ore is shipped to the metallurgical industries of Central Russia and possibly also to the Urals. Since the second World War, Nikopol' ore has also been shipped to Russia's European satellites. Poland alone imported 200,000 tons in 1955. Whether all of this came from Nikopol' or some of it from Chiatura is not known.

Most of the mining in the Nikopol' area is now underground. The ore is found at depths of four to 75 meters, in a horizontal layer varying from 1.5 to four meters in thickness. Before the war there were some 70 mines, all of which are said to have been reconstructed. As the Kakhovka reservoir fills up, the water level of the Dnieper will rise well above the level of the Nikopol' mines and of the city of Nikopol' itself. The mines and the city are protected by many miles of earth embankments whose destruction could have disastrous effects on mining operations.

d. Oil and Gas<sup>18</sup>

(1) Oil

The production of oil in the Ukrainian SSR, 531,200 tons in 1955, accounts for only one per cent of total Soviet production. Its importance, limited as it is, is the result of the fact that, to replace western Ukrainian supplies, long hauls from the Caucasus or imports from Rumania would be necessary. There are three producing areas, of which only one is significant. This last are the former Polish Carpathian oil fields centered in the Drogobych (4921N-2330E) area and extending northwest to Poland and southeast to the Stanislaw (4856N-2442E) area. This regions is lacking in coal and hydroelectric power, although new coal fields are being developed and hydroelectric plants are planned for the Upper Dnestr which will in time reduce the importance of local oil. This oil-producing area consists of a large number of small fields, most of them old, which have numerous wells whose average output is quite low. New oil fields have been developed in the Stanislaw region, at Dolina (4858N-2401E) and Bitkov (4837N-2426E) which are producing 40 tons of crude a day per well. Nearly all the output of these

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fields is refined nearby and consumed in the adjoining areas of the Ukraine and Belorussia. Oil would have to be shipped here either from Rumania or from the Caucasus as a substitute if the supply of petroleum products were interdicted. All wells in this area must be operated by pumping which is done electrically. It is likely that the fuel for the pumps is locally obtained oil or natural gas so that interdiction at key points is impossible. Heating during the winter is necessary to maintain oil flow. An oil pipeline of unknown dimensions connects the Drogobych oil-refining area to the consumption center of L'vov. Its pumping stations are vulnerable, particularly during the winter when higher pressures are required to maintain oil flow. The limited economic importance of the region served by the Carpathian oil fields reduces the value of interdiction of the producing areas or of oil transport.

Other oil areas whose production is unknown but believed to be insignificant are found in the central Ukraine. There are two producing fields, one of which is about ten miles southwest of Romny (5045N-3330E) and the other west, southwest of Poltava (4935N-3434E). Several new fields have been recently discovered whose possibilities are unknown. Two of these are northwest of Poltava: the Radchenkovo oilfield in the neighborhood of Mirgorod (4958N-3337E) and the Solokha (4959N-3418E) gas field. An oil and gas field has been located at Sagaydak (4802N-3245E) south-southeast of Kirovograd and a gas field near Mikhailovka (4717N-3511E) north of Melitopol'. A third producing area is located on the Kerch' peninsula. It is the westernmost extension of oil-bearing strata most of which are found in the North Caucasus. Chongeleik, sixteen miles south of Kerch', is the only producing field in the Crimea. Its output, which is believed to be insignificant, goes to the Krasnodar refinery in the North Caucasus.

The oil-refining capacity of the Ukraine far exceeds its current output of crude oil and is therefore a more significant target system. Refineries are found either in the oil fields or along the seacoast. There are a considerable number of small refineries in the Carpathian fields, some of which may no longer be in operation. The main refining center, with four plants, is Drogobych.

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Other refineries in the Carpathian region, all small, are located at L'viv, Stryy (4915N-2350E), Nadvornaya (4855N-2442E), Mukachevo (4826N-2242E), Sambor, Chop (4826N-2212E), Kolomyia (4832N-2503E), and Stanislav. Large refining facilities at Odessa process Rumanian oil pumped from Galati in Rumania and shipped by tanker and by rail. The Galati-Odessa pipeline has a diameter of 25 cm. The amount of crude oil shipped over this pipeline is unknown. (Soviet authorities estimate the capacity of 20 cm. pipelines at 18,000 barrels a day and 30 cm. pipelines at 30,000 barrels a day.) The capacity of the Odessa refinery was reported to be only 4,000 barrels a day in 1951. Other refineries along the Ukrainian seacoast are located at Nikolayev (4658N-3200E), Kherson (4638N-3237E), and Berdyansk (4645N-3648E). The crude charge capacity of these refineries is unknown. The last two are reported to have a thermal cracking charge capacity of 5,000 barrels per day, approximately the same as that of Odessa. These refineries obtain most of their oil from the Caucasian oil ports of Batumi, Tuapse, and Novorossiysk. Refined products are shipped from these coastal refining centers to centers of consumption, mostly by rail. A smaller proportion of refined products are shipped upstream on the Dnieper and Dnestr Rivers.

Oil pipelines are perhaps the most important oil installations in the Ukraine and certainly the most vulnerable to Special Forces operations. The Galati-Odessa pipeline has already been mentioned. If it were interdicted, Rumanian oil might still come by sea and to a lesser extent by rail. Another oil pipeline originates in the North Caucasus and pumps refined products (kerosene) from the Grozny area through Rostov to its present terminus at Trudovaya, just north of Gorlovka (4810N-3804E). Extension of this pipeline to Moscow via Voroshilovgrad and Voronezh is well advanced. A branch line to the Dnieper Bend area is planned but its present status is unknown. The pipeline has a diameter of 25 cm. Its estimated capacity is 1,500,000 metric tons per year. Oil is shipped from its present terminus to consuming centers principally by rail. It would be

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very difficult to replace this entire pipeline by rail transportation because of the acute shortage of tank cars as well as because of a general shortage of railroad equipment and the near-capacity utilization of some of the lines which would be needed to replace the pipeline. The extreme shortage of large diameter steel pipe and the limited capacity for producing such pipes makes repair of oil pipelines a time-consuming job. Generally, however, the destruction of pumping stations has a more lasting effect on oil flow than the destruction of pipeline sections. The locations of pumping stations within the Ukraine are not known although eleven pumping stations in the North Caucasus have been located.

(2) Gas:

The Dashava (4915N-2401E) gas fields play an important role in the fuel economy of the western Ukraine and will eventually supply Leningrad and other areas in central and northern Russia. A 16 to 20-inch pipeline connects the gas fields to Kiev. A branch from this line goes to Vinitsa. A pipeline from Dashava through Minsk to Leningrad with branches to Vilnius and Riga is among the projects of the current five-year plan,\* scheduled for completion in 1958. It will supply a large share of Leningrad's supply of gas, which will constitute approximately 80 per cent of Leningrad's fuel consumption. Other pipelines from the Dashava gas fields go to the sizeable cities of L'vov and to Poland. The Dashava-L'vov line is the only one relying solely on natural gas pressure. The alignment of the pipeline to Poland is not known, but since it crosses the Polish border at the village of Medyka (4949N-2257E), it is believed to be a continuation of the Dashava-L'vov pipeline. The last information of the Polish connection dates back to 1947, when 80.9 million cubic meters of gas were exported.<sup>19</sup> There are reports that the towns of Uzhgorod (4838N-2216E), Mukachevo (4826N-2242E), and Chernovtsy (4818N-2555E), will be supplied with gas by pipeline during the current plan period. The first two may be supplied from newly discovered gas fields in Trans-Carpathia.

\* According to a single source, it will be an extension of the Dashava-Kiev line.

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Less important than the Dashava fields is the gas field near Romny, which is connected to Kiev by pipeline. Southeast of Romny is the newly-discovered gas field of Solokha (4959N-3418E). Other recent discoveries include the Sagaydak (4802N-3245E) oil and gas field and the gas field near Mikhailovka (4717N-3511E). The importance of these new discoveries cannot be assessed yet. On the other hand, the recently-discovered Shebelinka (4927N-3631E) gas fields are very large and definitely important. They are already supplying Kharkov by pipeline (providing fuel for one of its large power plants and supplying the gas distribution system.) The pipeline is being extended beyond Kharkov through Belgorod, Kursk, and Orel to Moscow.\* A second gas pipeline from Shebelinka, listed among the construction projects of the current five-year plan, will go through Dnepropetrovsk, Kher-son, and Nikolayev' to Odessa. These two pipelines, once completed, will present valuable and vulnerable targets for Special Forces.

Other gas pipelines under construction include a 72 cm. line from Stavropol' to Moscow which cuts through the easternmost part of the Ukraine, following the route Stavropol'-Rostov-Voroshilov-Voronezh-Moscow. This line is probably in operation. Several cities along its route, possibly including some in the Donbass, will also be served. Gas pipelines have been reported under construction in the Dnieper Bend area to convey surplus coke oven gas from Krivoy Rog and Bagley (location unknown) to Dneprodzherzhinsk and Dnepropetrovsk, respectively.

Gas pipelines are the only means of transport used or feasible between the gas fields and the consuming centers. Their interdiction, therefore, will completely deny supplies of natural gas to Kiev, Vinnitsa, and other sizeable cities in the western Ukraine as well as the various cities in the eastern Ukraine which are along the routes of the gas pipeline to Moscow. A growing share of the natural gas supply is being used for industrial

\* A connection is planned with the Dashava-Leningrad pipeline following the route Orel-Bryarsk-Smolensk-Vitebsk-Polotsk.

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purposes and, conversely, an increasingly important proportion of the industrial fuel in these Ukrainian cities is provided by natural gas. Cities outside the Ukraine which are now or will soon be receiving Ukrainian natural gas are even more advanced in their conversion from solid to gaseous fuels and therefore would suffer greatly if their gas supply were interdicted. The critical shortage of large-diameter steel pressure pipe is even more serious for gas pipelines than for oil pipelines because of the impossibility of using railroads or waterways for the transport of gas. Pumping stations along the gas pipelines are unlocated. Since the main gas pipelines in the Ukraine have only recently been completed or are still under construction, it is likely that they have large automatically operated and fairly widely-spaced pumping stations (unlike old pipelines which have more numerous and smaller pumping stations). Pumping stations usually have their own emergency power sources, even when they are operated by current obtained from the power network.

The main producer of large-diameter steel pipe in the USSR is a plant in Taganrog, on the Sea of Azov, just east of the Ukrainian border. Other plants in the Ukraine include the recently-completed Makeyevka plant (4802N-3758E) and plants at Nikopol' and Nizhnedneprovsk (4830N-3501E).

e. Other Minerals:

The USSR acquired with former Polish territory important deposits of potash. The main mining areas are near Stebnik (4918N-2334E) and near Kalush (4902N-2422E). Processing plants are located in both of these cities. The Kalush processing plant was considerably expanded during the war and there are reports that a power plant with a capacity of 42,000 kw. was built here by the Germans in 1942. There has been no confirmation of the size of this power plant or even of its existence in recent years. Production of potash averaged 344,000 metric tons with a potassium oxide content of 64,000 tons annually between 1927 and 1937. In 1938 the potassium oxide content of the ore rose to 108,000 tons. There is no information on recent years. The 1950 goal called for an increase in production of 30 per cent above pre-war levels.

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This is one of the USSR's two important deposits of potash, the other being the larger Solikansk deposits in the Urals. Collection of the potash, which is generally found on or near the surface, seems to be conducted primarily by hand methods.

The Ukraine is the Soviet Union's main source of salt. Just before World War II it was producing 75 per cent of the total Russian output. The main deposit of rock salt, near Artemovsk (4836N-3800E), produced 1,350,000 metric tons in 1938 from beds up to 350 meters in thickness. Salt is also obtained from salt springs and salt lakes. The Slavyansk (4852N-3737E), salt springs near Artemovsk produced 65,000 tons of high-quality salt in 1933. The main source of salt obtained by solar evaporation is Lake Sakskeye (4507N-3333E), in the Crimea, which has produced about 75,000 tons a year. There are numerous other salt lakes in the Crimea which could be exploited but are not known to currently provide any substantial amounts of salt. Most of the salt used in Central and Northern Russia comes from the Ukraine. Although the Ukraine provides much of Russia's salt, other sources of supply are widely distributed throughout the Soviet Union which could be exploited should the Ukrainian sources be interdicted.

The mercury deposits at Nikitovka (4822N-3803E) were Russia's only domestic source before World War II. As a result of the temporary loss of this deposit during the war other supplies were hastily developed but it is probable that Nikitovka has recovered its role as the USSR's principal domestic source. It is possible, however, that the Nikitovka deposits are approaching exhaustion. The Soviet Union is not self-sufficient in mercury, obtaining substantial amounts from China.

The main source of magnesium in the Soviet Union is believed to be the salt brines of numerous lakes in the Crimea and in the Perekop isthmus areas. Most of the production of magnesium salts has been obtained from Lake Sakskeye, also a source of sodium chloride. Magnesium salts from Lake Sakskeye and other nearby lakes have been used for the production of metallic magnesium at Zaporozh'ye.

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Mines in the Petrovo area (4820N-3230E) near Dnepropetrovsk formerly supplied nearly all of Russia's requirements for crucible graphite, producing 4,800 tons a year. At present the largest producer is believed to be the Staryy Krym mines (4710N-3730E) near Zhdanov, whose output has been estimated at 8,000 tons a year (another and earlier estimate is 3,600 tons). A third important source of graphite is Zaval'ye (4812N-3002E) in the Zapadnyy Bug River valley (4,000 tons).

The Ukraine may be Russia's main source of piezoelectric quartz crystals and of zirconium. The quartz is obtained near Novograd Volynskiy (5036N-2737E) and the zirconium is produced near Zhdanov.

About 70 per cent of the USSR's production of domomite and magnesite is obtained from two quarries in the Ukraine, Nikitovka and Yama (4851N-3805E). Abundant supplies of gypsum are found at Artemovsk and Zaval'ye. The Soviet Union, however, has numerous other good sources of gypsum scattered in other parts of the country.

The Yelenovka limestone quarries are very important because of their proximity to the coal of the Donbass and the iron ore of Krivoy Rog, the other main metals required in the production of steel.

Phosphate deposits are found near the Ushitsy River (4845N-2715E) at depths of 120 to 210 meters. Phosphates are also obtained in the form of Thomas slag as a byproduct of the processing of high phosphorus Kerch' iron ore. These sources of phosphate fertilizer are important not because they are large in terms of the Soviet Union's total resources but because of the Ukraine's heavy requirements for phosphate fertilizer and of the very long hauls from larger sources in the Kola Peninsula and in Central Asia.

Some mention should be made of metal processing facilities in the Ukraine, which depend largely, even exclusively, on imported ores and concentrates. The aluminum plant at Zaporozh'ye may be the largest in the Soviet Union and certainly contributes an important share of total aluminum production. Its pre-war planned capacity was 90,000 tons of alumina and 57,000 tons of aluminum;



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out-dated post-war reports on actual capacity are 32,000 tons of alumina and 40,000 tons of aluminum. This plant was then producing over 16 per cent of the USSR output of both items. Before the war it obtained its bauxite from Tikhvin (5939N-3330E), but is now believed to operate almost exclusively on Hungarian bauxite. About 780,000 tons of bauxite, 80,000 tons of alumina, and 17,000 tons of aluminum ingots were exported by Hungary in 1955. About two-thirds of these exports went to the USSR, a good share of these probably to Zaporozh'ye.

A zinc smelter is located in Konstantinovka which operates on concentrates from Central Asian ores and possibly also from concentrates obtained from the North Caucasus. In 1937 its capacity was 35,000 tons and its output was 12,900 tons. Cadmium is obtained as a by-product. Before the war there were tin reclaiming plants at Kiev and at Dnepropetrovsk which may have tin ore refining facilities. If so, they must obtain their tin ore and concentrate from Soviet Asia or from Southeast Asia.

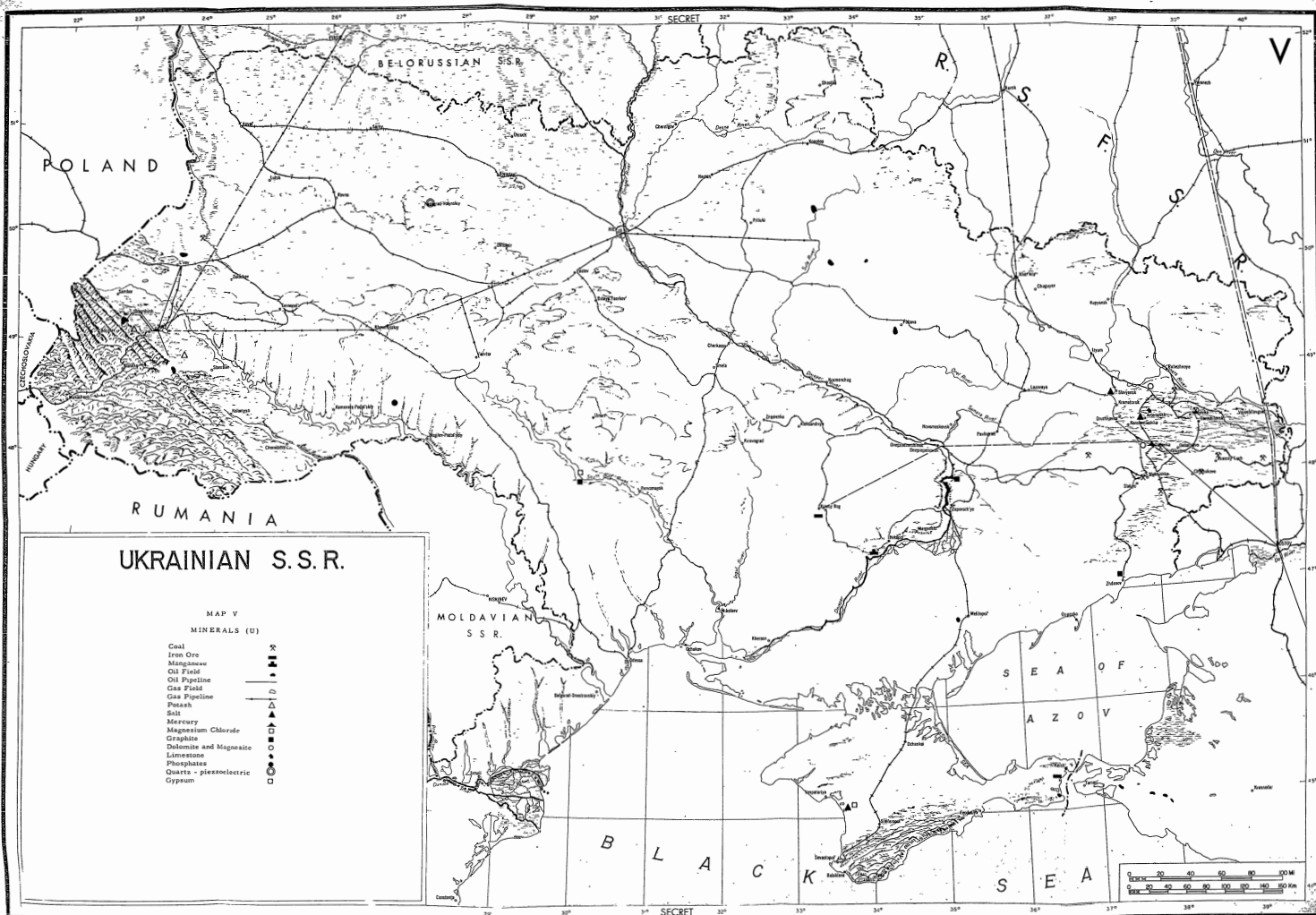
f. Conclusions

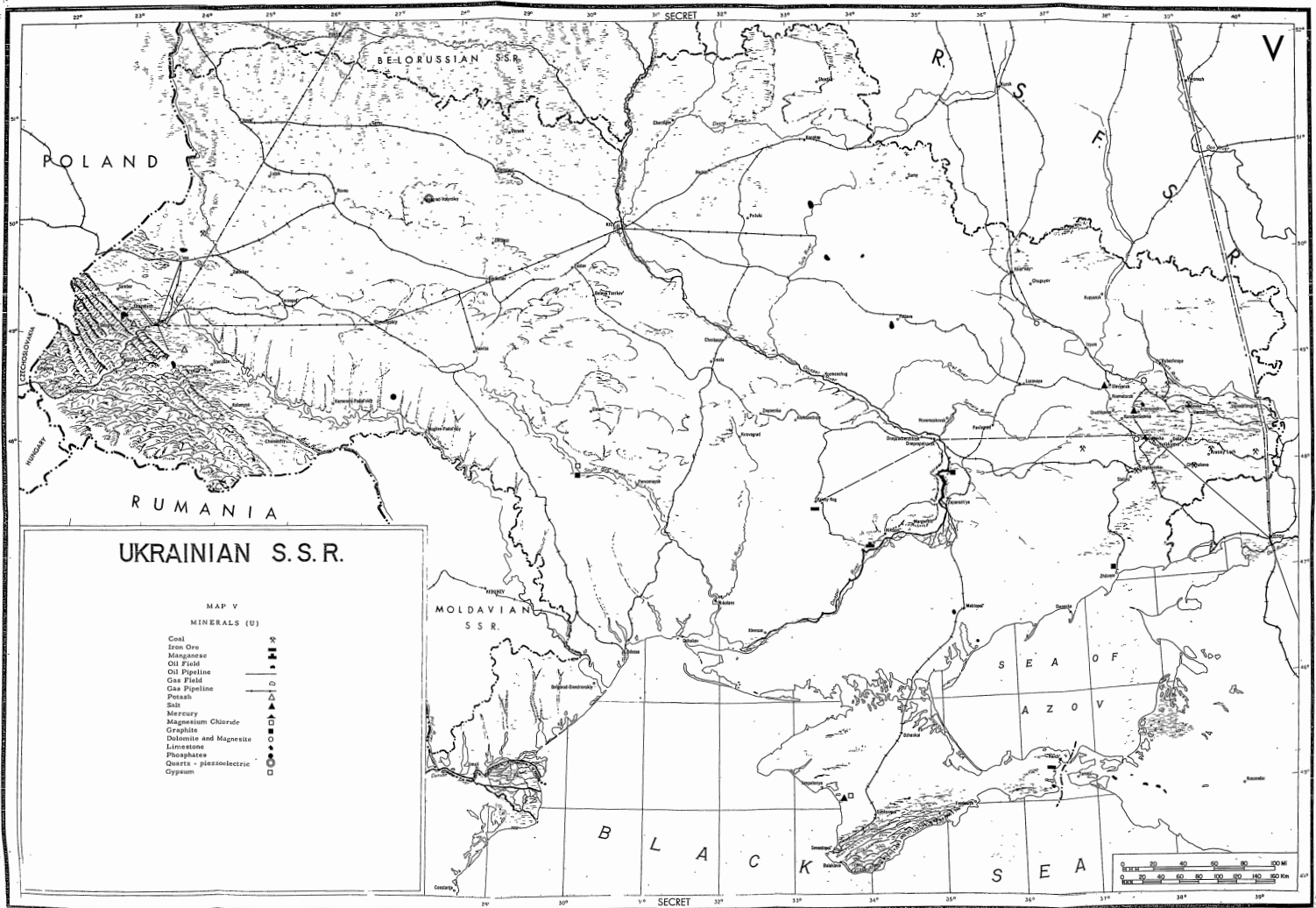
This section has concentrated on a discussion of the location of the main minerals in the Ukraine and of the minerals-processing facilities. The location of nearly all manufacturing activity significant for Special Forces operations is covered implicitly.

Most of the basic manufactures of the Ukraine are located near the principal raw materials: coal, iron ore and manganese. Much of the engineering industry and of the chemical industry, depending upon the output and by-products of basic industry for its materials, are also located near these main raw materials. Ukrainian heavy industry could not therefore be readily interdicted by denying it raw materials, nor by denying it electric power (see Sec. 3 above), since power plants are mainly in the heavily industrialized regions and utilize local sources of coal. The location of power-oriented industries such as aluminum and of industrial-market-oriented industries such as mining equipment

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in the Ukraine coincides with the location of raw materials-oriented industries. The key vulnerabilities in the Ukraine, therefore, are those transport lines bearing Ukrainian raw materials and manufactured products to other parts of the Soviet Union and to the East European satellites, as well as the transport lines bearing raw materials and manufactured products from the RSFSR to the Ukraine. Of lesser importance are the supply lines from the satellites, bearing Rumanian oil and Hungarian bauxite. Some industries not located at the source of raw materials, for instance the oil-refining industry which obtains its supplies from Rumania and the Caucasus, are nevertheless invulnerable to interdiction of their supplies because these arrive by sea in large part. Other industries, located near the ultimate consumer market, are concentrated in the centers of the population. Agricultural-processing industries are widely distributed in farming regions. To the extent that light and consumer goods industries depend on local materials and supply local markets they, too, are difficult to interdict. Light and consumer goods industries which must import raw materials long distances or which supply extensive markets, although vulnerable, are of limited military significance.





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5. Telecommunications<sup>20</sup> (See Map W)

Local communications in the Soviet Union rely mainly on the wire network. Long-distance communications between widely-separated points in the Soviet Union and between the Soviet Union and its satellites are largely carried out by radio. The wire network and the radio communications network are closely integrated at all levels of administration and can therefore be used interchangeably for regional and interregional messages. There are several communications networks, both wire and wireless, which cover much or all of the Ukraine. Railroads, for instance, have their own wire network paralleling all main lines which can supplement the general wire network which usually parallels the principal highways. In some regions there are additional special-purpose wire networks, for instance, military lines, particularly along the Soviet borders, and special circuits or even special lines for the secret police and other government agencies. Special-purpose networks of radio communications stations include aeronautical radio stations, maritime and river navigation control stations, weather stations, and military stations. Some of the larger stations in the first two categories are known to be linked with the general communications network and could supplement general network capacity or substitute for interdicted stations in emergencies. The large number of powerful radio jamming stations which are located mainly near large centers of population and near the Soviet borders can be used for other purposes if necessary; conversely, communications systems can be used for jamming.

The multiplicity of communications networks makes effective interdiction very difficult. Radio stations particularly are generally located in urban areas beyond the reach of Special Forces and have their own auxiliary power sources, rendering them immune to indirect interdiction through cutting of transmission lines. Wire networks, of course, can be cut but the effect is limited by the availability of radio.

The highly centralized organization of Soviet telecommunications, with Moscow as the main center of radio and broadcasting communications and as

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the hub of the main telephone and telegraph lines, accounts for the over-all vulnerability of the system.

A second level of radio communications and broadcasting includes stations in each of the 16 republic capitals and in some of the larger cities. The main Ukrainian centers of radio communications are Kiev, Kharkov, and Odessa. All three have been used for international radio communications. Most international messages and messages between the most distant portions of the Soviet Union must be routed through Moscow. Interregional messages must be routed through the second-stage stations and only for regional and local messages is direct contact between stations at the third or lower level of administration possible. Since stations at the third or fourth level of the administrative hierarchy do not have the facilities or power to perform the functions of the second-level stations in interregional communications, the destruction of the second-level stations would greatly disrupt such interregional contact.

Radio broadcasting is also highly centralized, with many of the programs originating in Moscow. Powerful broadcasting stations in the Ukraine include Kiev, Kharkov, L'vov, Simferopol', Odessa, and Stalino. Each has a number of satellite stations broadcasting locally. At the lowest level is an extensive wired loudspeaker network through which nearly everyone in the Ukraine can be reached.

The location of the principal telephone and telegraph lines and of the main communications and broadcasting stations is shown on Map W. The differences in wire network density are quite marked. Density is greatest in the former Polish portion of the western Ukraine and in the adjoining parts of the pre-war Ukraine along the axis L'vov-Kiev. It thins out somewhat but remains fairly high all the way to the Donbass. The Donbass itself has a dense network and is well connected to the north through Kharkov to central Russia. The extreme north portion of western and central Ukraine, bordering on Belorussia, has a very limited number of telecommunications lines. The network also thins out in the southern Ukraine and, near the

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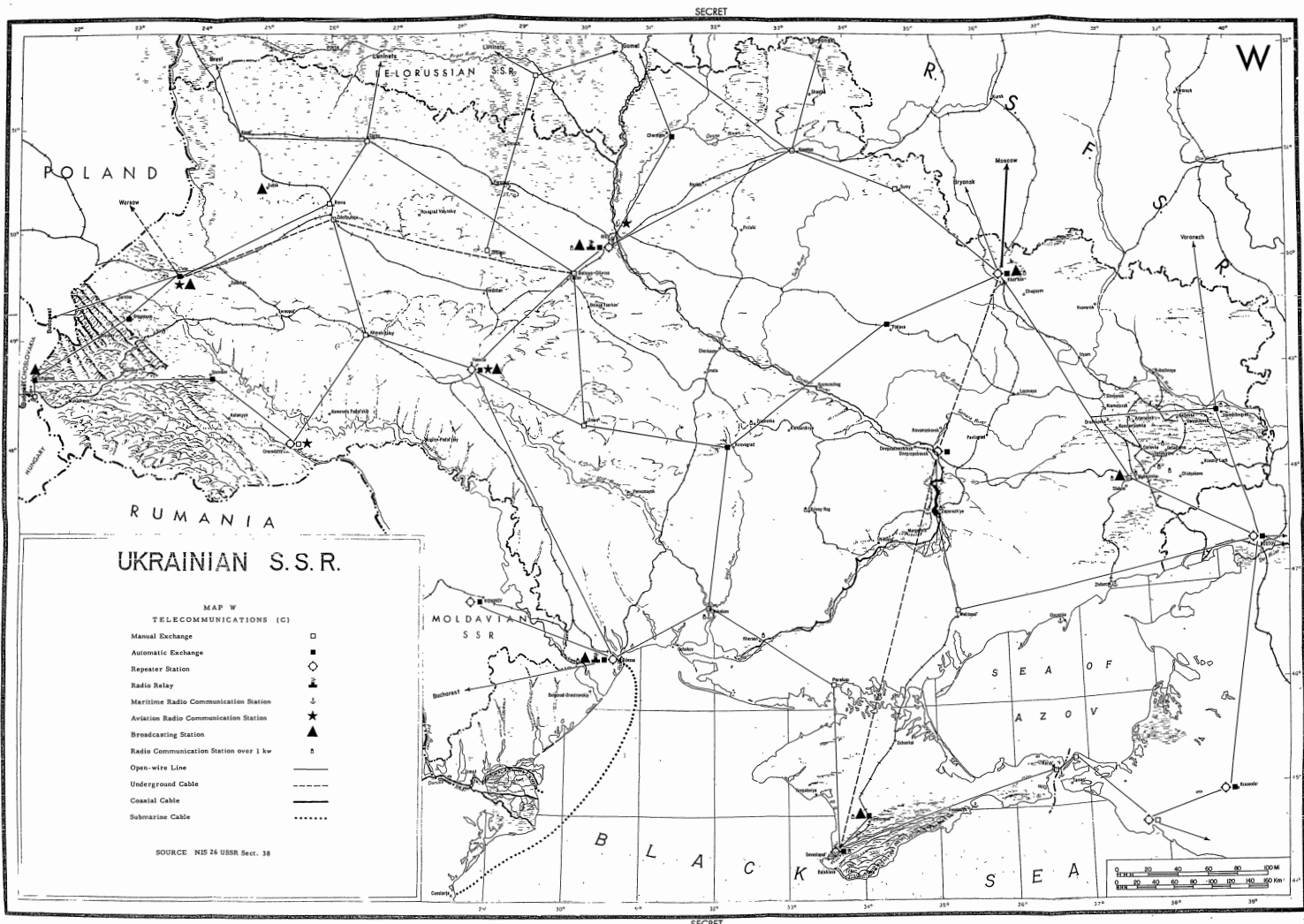
Black Sea, consists of very few lines terminating at various Black Sea and Sea of Azov ports. A submarine cable connects Odessa to Constanta, Rumania.\* A domestic submarine cable joins the Kerch' and Taman' Peninsulas. The sparse network along the Black Sea makes interdiction easy but since this area represents the terminus of the domestic wire network interdiction here would have far less serious consequences than interdiction severing the heavily populated portions of the Ukraine from contact with central Russia. The principal wire communication centers are Kiev, Kharkov, Simferopol', and L'vov. The latter is important for communications between Moscow and the East European satellite countries.

The effect of disrupting interregional contacts would be much greater in the Soviet Union than it would be in the United States or Western countries. The long distances involved minimize the feasibility of person-to-person contacts. The nearly unlimited scope of Soviet government and party interests make a proper functioning of Soviet society dependent upon the government and party control to an extent far exceeding anything found in Western societies where the role of government is limited and other organizations are responsible for major sectors of the life of the nation and are capable of operating on their own initiative. Finally, the extreme centralization of control in Soviet society as well as the lack of local responsibility and of local experience in policy-making and in the exercise of initiative render any loss of contact between Moscow and the republic capitals and between these capitals and their provinces a very serious matter.

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\* According to a single source, there is a cable between Odessa and Turkey.<sup>21</sup>





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## 6. Conclusions

The highest concentration of manufacturing facilities, important to the Ukraine, the USSR, and the Soviet Bloc, is in the Donbass. Here is located half the pig iron and one-third of the steelmaking capacity of the Soviet Union, its most important coal mining area, and an important proportion of the Soviet Union's heavy industry. Lesser concentrations of significant manufacturing capacity are found in the area of Kharkov and in the Dnieper Bend area. Kharkov is the center for the engineering industry, using as inputs the steel of the Donbass. The Dnieper Bend area, with its large supply of hydroelectric power, specializes in industries requiring large amounts of cheap power, including aluminum, magnesium, nitrogen and other chemical compounds, and special alloy steels. About one-third of the Soviet Union's shipbuilding capacity is scattered among several Black Sea ports. The large city of Kiev, although an important industrial center, specializes in agricultural processing, consumer goods, and other light industry only indirectly of military significance.

The mining centers of national and international importance other than the Donbass coal basin include the iron mines of Krivoy Rog and Kerch', and the manganese mines of Nikopol'. The Ukraine has a number of other mineral resources not located in the principal manufacturing regions which contribute a large share of the USSR's total supply of these minerals but are of less significance than the minerals mentioned above. Among them are the mercury mines of Nikitovka, the potash fields of Stanislav, the vanadium and phosphate found in Kerch', iron ores, graphite, magnesium salts, rock salt and piezoelectric quartz. The oil and gas fields and coal mines in the western Ukraine and the gas of Shebelinka, near Kharkov, are of considerable regional significance, releasing the railroads from the burden of shipping fuel from more distant sources.

The transport routes which provide the necessary materials for the principal centers of manufacture and those which distribute the strategic

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manufactured goods throughout the Soviet Union and the satellite bloc are the most important target systems. The Donbass obtains its iron ore and manganese from the west and ships out its pig iron, steel, and heavy industrial products mainly north to Central European Russia but in lesser amounts in all directions. The Donbass obtains gas and petroleum products from the North Caucasus by pipeline and rail and from the Transcaucasus by tanker and rail. Its deficit of wheat and other bulk agricultural products is mainly covered by shipments from the North Caucasus and Lower Volga area. Kharkov obtains its pig iron and steel from the Donbass and ships out its finished products in all directions but principally toward the north. Gas from Shebelinka may already be an important source of industrial fuel. The Shebelinka gas fields, which are connected to Kharkov by pipeline, are located about 160 kms. to the south-southeast. The heavy industry of the Dnieper Bend area obtains bauxite and aluminum mainly from Hungary, magnesium salts mainly from Krivoy Rog, and manganese from Nikopol'. The raw material for the steel industry in this area may be largely pig iron and raw steel from the Donbass rather than the ore from Krivoy Rog and Nikopol'. The bulk of raw materials for the agricultural processing, consumer goods and light industry in the Kiev area are obtained from the surrounding hinterland. Metals and metal products come from the eastern Ukraine and possibly in part from central Russia. The shipbuilding and engineering industries along the Black Sea ports presumably obtain their material from the steel industry of the Donbass and Dnieper Bend areas. They may also obtain a large proportion of their metals from the East European satellites by sea. Coal seems to be the principal source of fuel and power along the Black Sea coast in spite of the availability of petroleum products shipped by tanker from Rumania and the Transcaucasus and by pipeline from Rumania to Odessa.

It has been mentioned that the main direction of shipment of the manufactured products in which the Ukraine specializes is toward the north. Shipments of manufactured products, and particularly shipments of iron ore, manganese and other minerals, to the European satellites, are not important from the standpoint

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of an isolated Ukrainian economy, but they are vital to the operation of the economies of the European satellites. If in the future quasi-commercial relations will pertain between the USSR and its European satellites, the exports from the Ukraine assume great value as the necessary payment for valuable imports from the satellites. These imports, although only in fairly small proportion ultimately destined for the Ukraine, largely enter the USSR through Ukrainian territory by rail in the Carpathian Ukraine and by sea along the Black Sea coast.

The most significant target systems in terms of denying necessary supplies to principal manufacturing centers and in terms of interdicting shipment of finished products to consuming centers are in every case the railroads. Inland waterways are of limited actual significance and only one such waterway, the Dnieper River, has an important potential. This waterway is physically vulnerable through the destruction of dams, navigation locks, and in some places lengthy embankments. The most important waterway is the Black Sea, which cannot be interdicted by Special Forces operation. Indirectly, however, Special Forces operations can achieve a limited disruption of the Black Sea shipments by interdicting the very limited number of rail lines which provide access from the few Black Sea ports with adequate freight-handling capacity to the main centers of population and production. A large proportion of the Black Sea merchant fleet is oil-burning. Since oil can be obtained by sea it is not possible to immobilize the larger part of the merchant fleet by interdicting the rail lines supplying fuel. Only that portion of the Black Sea freight which operates on Donbass coal is subject to immobilization through interdiction of rail lines. Even here some coal can be shipped downstream on the Donets and Don Rivers to Rostov. Interdiction of natural gas pipelines would have serious consequences on the western Ukraine, particularly the large city of L'vov, and on Kiev which also depends to a considerable extent on natural gas from the Carpathian fields. The extent to which Kharkov depends on Shebelinka gas, only recently provided for the city, is not known but cannot be very great at present.

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The Donbass does obtain gas in large amounts from local coal, mainly as a by-product of coke ovens and blast furnaces. In the future natural gas pipelines under construction to Moscow and to Leningrad will be important targets. ( )

Electric power in the Ukraine does not constitute a highly vulnerable target system because of its limited dependence on long-distance transport of fuel and on cross-country high-tension lines. The Donbass is self-sufficient in power, utilizing local coal almost exclusively as fuel. The Dnieper Bend area relies largely upon hydroelectric plants but also depends to some extent on thermal plants which presumably burn coal from the Donbass, so that the thermal share of total capacity is subject to interdiction. The Dnieper Bend area is believed to import power from the Donbass to meet its industrial needs during low-water periods. With the completion of additional power plants on the Dnieper River its dependence on the Donbass and on thermal plants will be reduced if not eliminated but the fairly long transmission lines from the hydroelectric power plants through the consuming centers will be major points of vulnerability. There is no extensive power system development anywhere else in the Ukraine. The largest industrial centers outside of the Donbass and the Dnieper Bend rely exclusively on locally produced power, with the possible exceptions of Odessa and Kharkov. Many of these industrial centers, however, depend upon coal shipments from the Donbass as fuel so that the most effective way of interdiction of their power supply is through cutting the railroad from the Donbass.

Wire communications are not vulnerable to Special Forces interdiction because of the existence of well-developed networks of radio communication stations which can replace the wire network if needed. Since most telephone and telegraph lines parallel railroads or major highways they can be considered as joint targets with the transport systems. The centralized control of every aspect of the life of the nation makes the communications network much more important for continuing operation of the Soviet system than it is for the continuing operation of Western societies. Its interdiction therefore, although not easy, should not be disregarded. ( )

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PART VI

SPECIAL FORCES AREAS

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Introduction to Special Forces Areas

The areas in the Ukraine which are found to be most suitable for Special Forces operations in terms of their concealment possibilities and in terms of favorably disposed population groups, overlap only to a limited extent with the areas found most suitable in terms of density of vital target systems. The Donbass, most important in terms of its economic significance to the USSR, is wholly unsuited for Special Forces operations because of the lack of concealment, the high population density, the large number of Russians, and the largely Russianized Ukrainian population. Only to a limited extent is it possible to deny the products of this area to the USSR by interdicting transport lines beyond the Donbass. The rail line from the Donbass through Kharkov does pass near semi-forested areas east of Kharkov, but other rail lines going north which are located further east are inaccessible. The principal line transporting iron ore and manganese to the Donbass goes near small forested areas in the Dnieper Bend, but other rail connections further south could be used which are not within reach of Special Forces. Some of the connections between the Black Sea and the main population centers of the Ukraine and Central Russia do cross Special Forces Area 4 or pass through semi-forested areas east of Kiev, and in the Dnieper Bend, even though the Black Sea area itself is far away from terrain suitable for Special Forces. It is possible, however, to by-pass this suitable terrain through Rostov and other Sea of Azov ports for traffic with Central Russia, or to use circuitous rail connections from the Black Sea ports. Large portions of the central and southern Ukraine do not fall within any of the Special Forces Areas. Their total production is of some consequence, but because it consists almost exclusively of agricultural products it is too dispersed for effective interdiction. Insofar as these agricultural products are shipped north their use can be partly denied to the Soviet economy by cutting the rail lines passing through Special Forces Areas 3 and 4. The land connections between the East European satellites and the Ukraine can be severed in Special Forces

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Areas 1, 2, and 3, thus denying the satellites Krivoy Rog iron ore even though Krivoy Rog itself is unsuitably located for Special Forces operations.

Although some of the more important economic centers of the Ukraine are far removed from regions offering suitable concealment, they can be interdicted indirectly through their transport lines. Conversely, although the areas with the most suitable concealment and with the most favorable human elements are relatively poor in the production of strategic items, they serve as passageways for transport arteries which do connect the satellite economies with their principal sources of materials and with their main markets.

The five Special Forces Areas which have been delineated on Map X differ considerably in their suitability for Special Forces operations and particularly in the balance of the various factors: targets, geography, and human elements which determine their suitability. The real contrast, however, is not between the several Special Forces Areas, but between these areas combined and the large portion of the Ukraine which has been excluded from them. The excluded portion is entirely lacking in extensive forest cover or other terrain suitable for long-term concealment, and the greater part of it, because of its dominantly agricultural land-use, offers limited target opportunities excepting railroads passing through which connect the principal urban and industrial areas.

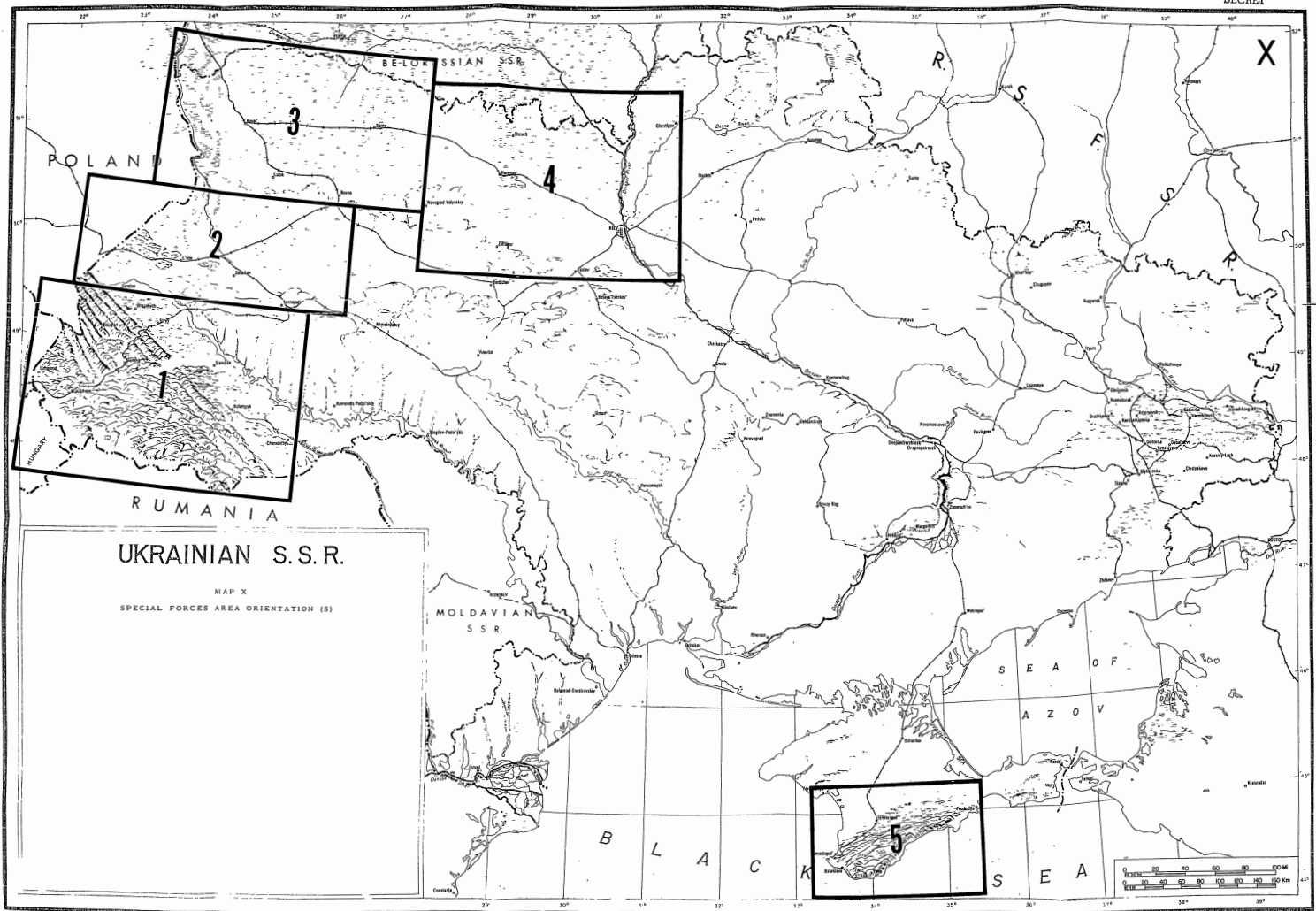
Each of the Special Forces Areas is followed by a partial list of key structures and accompanied by a map showing the principal target systems in that area. It should be emphasized at this point that neither the partial list of key structures nor the target systems shown on the map constitute target recommendations. The list of structures is as comprehensive as could be obtained in the limited time available for this study. It includes many structures, particularly power plants, which are located in urban areas and therefore immune to direct interdiction by Special Forces. Their inclusion is desirable in order to indicate, in the first place, the probable effects of interdicting other structures which are not located in urban areas, and



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in the second, to suggest possibilities for indirect interdiction (for instance, of power lines in rural areas connecting the urban power plants to their service area). Certain limitations have been necessary in the listing. No power plant of less than 5,000 kw. is knowingly included and no railroad bridge of less than 10 meters was knowingly indicated on the map. Much bridge information was obtained from large-scale maps which did not indicate length. Only bridges on principal highways were included, although for railroads every bridge over 10 meters on standard-gauge railroads was included whenever information was available. No attempt has been made in the case of railroad bridges to detail their length, material, or structure. In many cases the only information available on these points dates back to the war period. Many of these bridges were destroyed and have since been replaced, possibly being now of different material and construction. As long as the railroad is in operation it may be assumed that a bridge of approximately the same dimensions does exist at the same location. In the treatment of power transmission networks, gas and oil pipelines, and irrigation canals, only principal structures have been covered and local distributing networks have been omitted from consideration.

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Special Forces Area 1

Special Forces Area 1 provides one of the most favorable regions in the Ukraine for anti-regime activities. It is dominated by a section of the Carpathian Mountains which extends from Czechoslovakia and Poland in the northwest of the area into Rumania on the southeast. The mountains are heavily forested and in places highly dissected, and provide excellent conditions for long-term concealment for large groups. During World War II anti-German partisans controlled large parts of the mountains, and in the period after the war anti-Soviet insurgents continued as recently as 1956 to oppose Soviet forces and to destroy important installations. The area has been the strongest center of Ukrainian nationalist activity. In the northeastern corner of Area 1 the Volyno-Podol'skaya Upland with its more gentle relief and limited forest cover is less favorable for evasion. The Transcarpathian Plain in the southwest is flat and except for small wooded patches also offers little concealment.

The area is significant to the Soviet Union for its deposits of potassium salts, of which it is one of Russia's main domestic sources. The natural gas of Dashava and other gas fields is important to Kiev and other urban centers of the western Ukraine and will eventually add considerably to the fuel supplies of cities in central Russia. The area wins additional significance through its location on Russia's westernmost boundary with Eastern Europe. The entire common Russian-Czechoslovakian and Russian-Hungarian borders are in this area, as are parts of the Russian-Polish and Russian-Rumanian borders. The railroads crossing these borders carry an important share of Soviet satellite traffic and would be of great military importance in case of hostilities in Europe.

1. Cover Areas

Opportunities for concealment and evasion are excellent in the mountain forests of Area 1. The Carpathian chain, the dominant terrain feature, cuts a broad, diagonal swath across the area from northwest to southeast. In its northeastern parts lie the incised valleys of the Prut

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and Dneestr Rivers; immediately beyond the valley of the Dneestr lies the Volyno-Podol'skaya Upland, heavily dissected by a number of north-south affluents of the Dneestr. The well-watered Transcarpathian Plain lies southwest of the mountains; the Tisza is its major stream and a significant barrier to movement.

The Carpathians occupy an area about 150 by 80 miles in size, roughly defined in the northeast by the cities Sambor (4931N-2312E), Drogobych (4921N-2330E), Bolekhov (4904N-2352E), and Kolomyia (4832N-2303E), and in the southwest by Uzhgorod (4838N-2216E), Mukachevo (4826N-2243E), and Chust (4810N-2316E). It is in this mountainous part of the area that conditions of terrain and vegetation are most favorable for operations by Special Forces. The abundance of forests makes it unnecessary to indicate individual complexes, although certain broad distinctions within this favorable zone may be noted. Almost the entire southeastern section of the Carpathians, lying southeast of a line between Chust and Stanislav (4856N-2442E) and based on the Rumanian frontier, is covered with near-continuous forest. Conditions are best in the higher summit regions toward the interior of the massive mountain system. Summits are generally rounded, but there are some sharp crestlines and conical peaks. Considerable loose debris may be encountered on summits and steep slopes. Rocky precipices, amphitheater-like basins, and waterfalls are numerous. Throughout the area, mountain streams have cut deeply into the terrain and follow winding, narrow valleys or deep gorges. An unusual aspect of the Carpathians is the relative flatness and openness of their summits which makes movement along the heights frequently easier than at lower or intermediate elevations. The summits are often covered by alpine meadows which are favored areas of Carpathian shepherds who drive their flocks to the high feeding grounds in the summer months. Dense forests clothe most slopes and offer ample opportunity for concealment. Broadleaves, which primarily have a seasonal concealment value, dominate the lower slopes, but the upper slopes are covered with evergreens. The upper limit of forest growth is somewhat irregular, but is generally reached at an elevation of about 5,250 feet.

Two other significant bands of continuous or near-continuous forest cover

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follow parallel courses from the satellite frontiers in the northwest until they merge with the larger forest block of the southeast. The larger of these forest zones proceeds from the frontier with Czechoslovakia and is about 70 miles in length; it varies in width from a maximum of about 30 miles to about 15 miles before merging with the forests of the southeast. Elevations are not as great as in the southeast, but slopes are steep and the action of intrenched streams has caused considerable dissection. Alpine meadows are not as common, a reflection of lower elevations, and the thick forests which cover the slopes also spread over the crests and summits in many instances.

The other parallel band of forest, lying to the northeast, commences at the Polish frontier and, gaining in elevation and ruggedness, continues for about 75 miles until it merges with the forests of the southeast. The forest cover is much fragmented and discontinuous in the northwestern part from the Polish border until reaching the region south of Borislav. Continuous forest, ranging in width from 10 to 30 miles, then stretches for over 50 miles to the forests of the southeast. Inasmuch as only a small part of this section of the Carpathians is above the timber line, mountain meadows are not frequently encountered. The summits are generally rounded, and relatively easy to traverse; the slopes are gentle in the northwest but become steeper as elevations increase. Forest cover is dense, and passes from broadleaf stands at lower elevations to the evergreen forests of the upper slopes.

The repeated references to high summits, steep and debris-strewn slopes, narrow valleys and gorges, and dense forests are a sufficient indication of the difficulty of movement throughout this area. Added to these permanent obstacles are the hardships of a seasonal nature, such as the deep snows and bitter cold of winter, and the spring thaws and sudden summer downpours which turn mountain streams into impassable torrents.

Settlement patterns in the mountain reaches vary with elevation. In the foothills and broad, low-lying mountain valleys permanent villages which

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have now been collectivized prevail. In the valleys the villages form almost continuous ribbons of settlement; in the foothills they are separated frequently by grain fields or by vineyards and fruit groves. On the mountain slopes below 3,500 feet the lowland villages give way to groups of a few households and to individual farmsteads. The farmsteads are scattered along the mountain slopes several miles apart. Above 3,500 feet only temporary buildings are found. The buildings are little more than shacks, used for shelter by shepherds and woodsmen during the summer months.

The northeast corner of Area 1, which is a part of the Volyno-Podol'skaya Upland, is poor in forest cover. Narrow bands of forest occupy interstream areas between some of the north-south flowing tributaries of the Dnestr, and in other sections forests are located along the stream valleys. Rural population density in the upland is high, averaging about 180 inhabitants per square mile. The fields are intensively cultivated, and possibilities for evasion are poor.

In the Transcarpathian Plain conditions are also generally unfavorable for Special Forces. The relief is unbroken and there are no continuous or extensive wooded patches. In the central districts north and east of Beregovo (Berehovo) (4813N-2239E) a marsh region is found, but large sections have been drained and placed under cultivation, and the region is only moderately isolated. Elsewhere population density is high and the land is extensively farmed.

Although the mountain regions of Area 1 offer some of the most suitable terrain and concealment for Special Forces operations in the Ukraine, certain unfavorable factors must be noted. First, where the mountain forests approach the satellite frontiers, the security control maintained within the border zones is very strict. Secondly, interior troops of the MVD and the regular ground forces of the Soviet Army are present in considerable strength in this general area. Finally, the area is crossed with tourist trails and dotted with numerous resorts, and consequently is less isolated than other mountainous parts of the Soviet Union.

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2. Population and Resistance Factors

The principal ethnic groups in Area 1 are Ukrainians, Poles, and Hungarians. The Ukrainians are the predominant group and are settled everywhere, although they are a minority in the Transcarpathian Plain, in the area's southwestern corner. Poles are most numerous in the formerly Polish districts and particularly in the vicinity of Ternopol' (4933N-2535E). In general they constitute less than 15 per cent of the population. Hungarians are centered almost exclusively in the Transcarpathian Plain where they occupy a narrow belt extending along the Ukraine's border with Hungary and Czechoslovakia. Small numbers of Moldavians are to be found in the south-east, in the district surrounding Chernovtsy (4818N-2555E); a small Rumanian settlement extends into the eastern tip of the Zakarpatskaya oblast; in the urban areas, particularly at Stanislav, there are small Jewish colonies; here and there in the rural areas small villages of Czechs or Germans are occasionally to be found.

Opposition activities in Special Forces Area 1 have been more extensive and have continued for a longer period of time than in any other section of the Ukraine. The entire area was first incorporated into the USSR only after 1939 and includes parts of the territories transferred from Poland and Rumania and the entire territory transferred from Czechoslovakia. Among virtually all ethnic groups there has been great dissatisfaction with collectivization and in many instances with their transfer to Soviet rule. Consequently a firm basis for opposition to the regime has been laid. In the formerly Polish districts the Ukrainian population has traditionally been a virulently nationalist group holding strong aspirations for the establishment of an independent Ukrainian state. As a result, their opposition to Soviet rule is doubly strong. The Poles similarly have a long record of hostility towards Russians, and although those most strongly opposing Soviet rule were repatriated to Poland immediately after World War II, other Polish nationalists remain and can be expected also to assist Special Forces.

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The unwillingness of many of the inhabitants to accept Soviet rule was indicated during World War II by their extensive participation in both anti-Russian and anti-German partisan activities. The mountainous parts of Area 1 west of a line from Stanislav to Chust were almost completely controlled by such partisans. To the east and in the foothills and lowlands the partisans were less numerous, although German observers reported many bands which moved throughout the area from place to place. The anti-Russian sentiments of the population were also indicated by their unwillingness to assist pro-Soviet partisans. When the Russian partisan leader Kovpak embarked on a raid into the Carpathian Mountains late in 1943, he was apparently unable to obtain sufficient food and supplies to remain. In the period after World War II measures directed against Soviet authority continued on a major scale. Until 1950 large insurgent bands numbering in some cases more than 100 men fought actively against Soviet forces. After 1950 many of the bands were destroyed and others diminished in size, but resistance activity on a limited scale continued to be reported through 1956. Resistance has been centered in five areas: (1) in the Volyno-Podol'skaya Upland south and southwest of Ternopol'; (2) along the left bank of the Dnestr River near the villages of Rogatin (4925N-2442E), Berzhany (4926N-2458E), and Khodorov (4924N-2425E); (3) in a broad belt extending into the Carpathian Mountains from the Dnestr valley in the vicinity of Kalush (4902N-2421E) and Dolina (4850N-2401E); (4) in the districts south of Stanislav and extending into the Carpathian Mountains around Nadvornaya (4841N-2434E) and Kolomyia and along the upper valley of the Prut River; and (5) throughout the quadrangle lying in the northwestern corner of the area and bounded by the towns of Turka (4908N-2302E), Droghobych, Stryi (4915N-2350E), and Bolekhov. A sixth center of resistance has appeared in recent years in the wooded sections northeast of Uzhgorod. Here, partisan activities have been reported as recently as December 1956.

Although the resistance history of Area 1 offers ample proof of favorable conditions for resistance and guerilla potentials in support of Special Forces operations, the cleavage between the nationalistic Ukrainians and



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Poles in many sectors of the region may present serious problems to Special Forces units engaged in the task of organizing resistance groups.

3. Economic Vulnerabilities

There is no sizeable city anywhere in Area 1. Industry other than oil refining and processing of potassium ores is limited to timber-processing, processing of agricultural products, and small manufactures producing items for local consumption, including oilfield equipment. The economic importance of this area derives almost exclusively from its mineral production.

A number of small oil and gas fields are scattered over a distance of nearly 100 miles in a northwest-southeast direction along the northeastern slopes of the Carpathian Mountains in this area. The main fields are in the neighborhood of Borislav (4918N-2325E). Other fields are located near the Polish border southwest of Sambor. The southernmost fields are near the Rumanian border south and southwest of Stanislav. The northernmost fields extend into Area 2 and into Polish territory. Most of these fields, whose location is indicated on the accompanying map, are quite old and their output per field and per oil-well is small. The Borislav field in 1939 had 2,000 wells, only half of which were producing. Total oil production is in the neighborhood of 400,000 tons\* per year, an amount of significance to the western Ukraine which is far removed from larger sources of petroleum products, but of no import to the country as a whole. Oil from these fields is believed to be refined mainly in the area, with the main refineries being located at Drogobych and L'vov (Area 2). Small refineries are also located at Sambor, Mukachevo, Stryy, Chop (4825N-2211E), Nadvornaya, Stanislav, Kolomyia, Bolekhov, and Borislav. Some of these were destroyed in World War II and probably have not been rebuilt. Only the Drogobych refineries (located half a mile southwest of the town, and east of the town near the railroad station) are known to have thermal cracking facilities and none of the others, with the possible exception of

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\* Total Ukrainian production was 531,000 tons in 1955, most of which came from this region.

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L'vov, are believed to have any such facilities. New oilfields with a daily output of 40 tons per well are being developed in the Dolina and Bitkov (4837N-2427E) areas. A number of the oilfields also produce natural gas. Other oil-bearing fields which are producers of natural gas include Borislav, Rypne (Rernoye) (4851N-2409E), and Bitkow. Only Borislav and Dashava are tapped by important pipelines.

Natural gas production is more important to the economy of the Ukraine than the limited oil output of this area. The central point for pipeline distribution of natural gas is Stryy, which is the junction of pipelines from the nearby gasfields of Borislav and Dashava (4915N-2401E) and the origin of a gas pipeline going north to L'vov and the important gas pipeline going east-northeast to Kiev, with a branch to Vinnitsa. The pipeline to L'vov is operated by natural gas pressure. Natural gas is exported to Poland from the gas fields in this area but the course of the pipeline over which gas is pumped is not known. It may originate at Stryy in this area or it may possibly originate at L'vov in Area 2. The border-crossing point into Poland is Medyka in Area 2. The pipeline to Kiev is quite important to the fuel economy of this largest of Ukrainian cities. It has a diameter of 20 inches and a capacity variously reported as 1.5 and 3.2 million cubic meters per day.<sup>1</sup> The pipeline is laid about one and one-half meters underground and, at river crossings, it is laid at the river bottom. There are at least five compressor stations along the line but their location, other than at the point of origin, is not known. A pipeline north to the Leningrad area is planned. Its construction would considerably enhance the importance of the Dashava gasfields. The course of the projected pipeline will be Dashava-Minsk-Leningrad with branches to Vilnius and Riga. Other projects for gas pipeline construction in this area during the current five-year plan include connections to Uzhgorod, Mukachevo, and Chernovtsy. The last town will be served by a pipeline originating at Stryy; the alignment of the other pipelines is not known. Since gas has been discovered in the Transcarpathian area, it seems likely that Mukachevo and Uzhgorod will

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be supplied from this new, unlocated source.

Short oil pipelines converge on Stryy from nearby oilfields. Their approximate alignments are Borislav-Drogobych-Stryy, Dashava-Stryy, and Dolina-Bolekhov-Stryy (the last is not mentioned by most sources). A lengthier pipeline originates at Stryy and terminates at L'viv.

Pumping stations, whose locations are not known, are the critical installations on the pipelines. Shortages of large-diameter steel pipe and long hauls from the few plants manufacturing such pipe enhance the value of interdicting pipeline sections. Next to railroads, pipelines are the targets in this area whose destruction would have the most serious effects on the Ukrainian economy.

The Soviet Union acquired major deposits of potassium salts from Poland at the end of World War II. The main deposits are located near Kalush, near Stebnik (4918N-2333E), and near Kolomyia. Production from these deposits averaged 344,000 metric tons a year in the decade from 1927 to 1937, with a potassium oxide content of 60,000 to 70,000 tons, but increased to about 108,000 tons potassium oxide in 1938. Current output is not known. It may be less than pre-war output because of Russian control over the very large potassium salts production in East Germany. The 1950 production goal was a 30 per cent increase above the pre-war level. The Stanislaw and nearby deposits are the second largest domestic source of potassium in the Soviet Union, the largest being Solikamsk in the Urals. Mines are in operation at Kalush, at nearby Kropivnik (4902N-2417E), and near Stebnik. Processing plants are located at Stebnik and Kalush.

Substantial deposits of salt are also found in this area, but they are not important to the Soviet economy as numerous other and larger deposits are available. A salt processing plant is located at Bolekhov.

Railroads are the most important target system in this area. Their value in conveying the mineral, forest, and agricultural products of this region is small because of this region's limited economic value and because

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its most important export product, natural gas, goes by pipeline. The importance of railroads is primarily due to their function as a link between the Soviet Union and its East European satellites, the area serving as an important passageway. All of the rail crossings into Czechoslovakia and Hungary are on the borders of this area, as are the rail crossings into northern Rumania. The principal connection between Russia on the one hand and Czechoslovakia and Hungary on the other is the line from L'vov through Stryy and Mukachevo to Chop, where it branches to Cierna nad Tisou in Czechoslovakia and to Zahony in Hungary. It is single-tracked across the Carpathians but double-tracked, with one Russian-gauge and one standard-gauge track, from Mukachevo to Cierna nad Tisou and from Chop to well past Zahony. Transloading can take place anywhere along these tracks, permitting rapid expansion in transloading capacity. Multiple sidings are found at a number of points between these termini which could be used for transloading. The main center for transloading on the Ukrainian side of the border at present is Chop, which has facilities for changing axles on trains as well as for loading and unloading of freight cars. Extensive facilities are also located at Mukachevo. The most vulnerable feature along this connection is probably the Carpathian Mountains crossing rather than the transloading facilities because of the possibility of rapid expansion in the amount of transloading if necessary. No such expansion in the rail line capacity is possible along the defiles, steep grades, and sharp curves of the Carpathians. Capacity in the mountainous sector is reported to be 12 to 15 pairs of trains a day, and only four to six pairs in winter.<sup>2</sup> A second rail line to Czechoslovakia and Hungary, the Sambor-Uzhgorod line, branching at the latter town south to Chop and west to Banovce in Czechoslovakia, may be operational. This single-track line, which was formerly in Czech and Polish territory, was standard-gauge throughout at the end of the war. War damage was not repaired for some years thereafter, so that the line was not usable north of Uzhgorod. Recent Soviet maps show the rail line in operation north of Uzhgorod to Uzhok (4859N-2252E), near its

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maximum elevation. In 1951 tunnels near Uzhok were being repaired. Since there is no purpose, either economic or military, in reconstructing this railroad only as far as the heights of the Carpathian Mountains, it is assumed that the remainder of this route is being rehabilitated as a broad-gauge line.<sup>3</sup> It would use the transloading facilities centering on Chop for traffic with Hungary but would make available a new connection between the Soviet Union and Czechoslovakia via Banovce. Transloading facilities on this new connection are under construction at Matovce (Czechoslovakia). The principal connection between Russia and the northern part of Rumania runs between Delyatin (4832N-2437E) on the Russian side and Sighet on the Rumanian side. At Delyatin this single-track line has connections through Stanislav north to L'vov and Ternopol', and east through Kolomyia to Chernovtsy. A fairly long sector from Sighet to the Russian border has both broad-gauge and standard-gauge tracks. The main transloading facilities between broad and standard gauge are located in Valea Visaului, Rumania. The grades and curves over the Carpathian Mountains are the limiting factors on freight over this line as over the lines further to the west. The existence of parallel broad- and standard-gauge tracks in Rumania for some distance permit rapid expansion of freight transloading operations. A second railroad crossing into Rumania lies half-way between Chop and Sighet. It originates on a single-track rail line\* between Batovo and Sighet which runs along the Russian side of the border most of the way but crosses into the Rumanian side at Sighet. The crossing into Rumania originates on this line near Chust and continues to Halmeu and Satu-Mare in Rumania. There is no extensive development of transloading facilities near this crossing on the Russian side, Chop or Halmeu being the main trans-shipment centers (according to various reports which conflict on the gauge of the Batovo-Sighet rail line), nor is there any information on sizeable freight movements. Since this line does not continue across the Carpathian Mountains

\* Various reports to be standard-gauge and broad-gauge. It is probable that this line, formerly standard-gauge, has been converted recently to broad-gauge.<sup>4</sup>

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but must depend upon one of the other aforementioned lines for connections with Russia, it does not significantly contribute to freight capacity between Russia and the satellites. A third crossing into Rumania runs further east, from Chernovtsy on the Russian side to Dornesti on the Rumanian side. This line does not cross the Carpathians proper and therefore its use is limited by transloading facilities (which are located at Dornesti) rather than by rail line capacity. Heavy oil traffic from Rumania is reported on this line with lumber being also an important import. The possibilities for shifting freight from one to another of these various border-crossing lines are extremely limited on the western side of the Carpathian Mountains since only three of the lines (one of which, Mukachevo-Sambor, may not be in operation) are connected at all and then by a single-track railroad which may be standard-gauge. All of these lines are connected on the eastern side of the Carpathians by the very roundabout route whose contours are determined by the outflankings of the mountains and the course of river valleys. This route connects Sambor, Stanislav, and Chernovtsy, continuing east into the Moldavian SSR and northwest into Poland. Its capacity is only a small fraction of the combined capacities of the several border-crossing rail lines and therefore its value for re-routing freight across the Carpathians is limited.

All the rail lines in this area cross highly dissected terrain and are physically vulnerable at many points where they run in defiles along deep cuts, or cross numerous bridges. Each of the lines crossing the Carpathians goes through several tunnels near its highest elevation. They depend upon fairly distant sources of coal, although it may be feasible to obtain coal from Poland and from the L'vov-Volynskiy coal mines (Areas 2 and 3) for rail line operation.

The most important highways in Area 1 are a series of routes originating at L'vov (Area 2) and crossing the Carpathians, providing access to Czechoslovakia, Hungary and Rumania. Other routes to Rumania pass east of L'vov, through Ternopol' (4933N-2535E) and Proskurov (4925N-2700E) to Chernovtsy.

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Of lesser importance are the east-west routes along both slopes of the Carpathians which are of local importance as links between sizeable towns and which can serve as interconnections between the interregional north-south routes.

The westernmost highway originating at L'vov goes through Sambor and Uzhgorod to Chop, with connections west to Czechoslovakia at Uzhgorod and Chop and southwest to Hungary at Chop. This route, formerly gravel and less than five meters wide in the Uzhok Pass area, has been completely rebuilt and is reported to be of concrete from Chop to Uzhok. Presumably it has been concreted and widened north of Uzhok also. There are at least 75 bridges and overpasses between Chop and Uzhok, 50 of them north of Perechin (4846N-2228E). These were formerly temporary wooden structures but are believed now replaced with permanent concrete structures. Two other Carpathian Mountain crossings have a common roadway from L'vov to Stryy, where they diverge, the westernmost going through Bolekhov to Mukachevo and the easternmost through Dolina to Chust, with secondary road connections to Satu-Mare, Rumania. Both of these were formerly gravel or crushed-rock surfaced. The Mukachevo route has been completely rebuilt and widened from Mukachevo to Verecky Pass (4845N-2304E) and presumably also north of the Pass. The rebuilt section is now largely concrete although there were some gravel sections in 1954. Some sharp curves and serpentines have been eliminated. The Dolina-Chust route was also undergoing extensive repairs in 1952. It has 50 bridges in the Vyshkov (4844N-2341E)-Chust sector alone. Possibly the temporary timber bridges on these roads have been replaced with permanent concrete structures.

A fourth north-south highway across the Carpathians originates just east of L'vov at Kurovitse on the L'vov-Ternopol' highway and goes through Stanislav and Delyatin to the Rumanian border at Trebusa. From Kurovitse to Stanislav it is of stone block construction and more than eight meters wide; from Stanislav to Nadvornaya it is cobblestone, in poor condition, with wooden bridges. This Carpathian Mountain crossing can also be ap-

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proached from Ternopol' instead of from L'vov. Two other north-south highways with connections to Rumania, from Ternopol' and Proskurov respectively, meet a few miles north of Chernovtsy. South of the town they diverge again, one going southwest through Storozhinets (4810N-2545E) to Vicovul-de-Sus in Rumania, and the other going south-southeast (mainly beyond the limits of Special Forces Area 1) to Seret, Rumania. Neither of these two routes through Chernovtsy crosses the main ranges of the Carpathians.

The east-west highways in Area 1 are less important from a regional standpoint than the north-south routes. In the Transcarpathian region the main highway follows the route Chop-Mukachevo-Beregovo (4813N-2239E)-Chust-Trebusha, connecting all north-south routes with the exception of those through Chernovtsy. The Chop-Mukachevo sector is concrete and 12 meters wide, with 9 concrete bridges; the Mukachevo-Beregovo sector in 1952 was half cobblestone and half concrete; the Beregovo-Chust sector is mostly concrete and in good condition, but most of the bridges are reported to be temporary wooden structures. Concrete surfacing continues east of Chust to Sekernice, with macadam past Sekernice. There are two other good road connections between the Uzhgorod and the Mukachevo highways across the Carpathians. The connection between Uzhgorod and Mukachevo was under repair in 1952; bridges at that time were temporary wooden structures. Further north, between Perechin and Polyana (4839N-2258E), another road connection has been completely rebuilt.

North of the Carpathians there is a single good road between Sambor and Stryi (which continues west of Sambor to Przemyśl in Poland). Between Stryi and Stanislaw the main route goes through Dolina, but there are other good secondary roads. Between Stanislaw and the Chernovtsy-Ternopol' and Chernovtsy-Proskurov highways there are several routes, with roads along the Prut and Dnestr Rivers going to Chernovtsy proper whereas other routes run further north.

All of these roads, with the exceptions mentioned above, have gravel or crushed-rock surfaces. They are described as all-weather, but in fact

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are open only to light traffic in spring and fall. They are often closed by snow during the winter (particularly the routes crossing the Carpathian Mountains). There is almost no mechanical snow-clearing equipment. Alternate routes are feasible north of the Carpathians but not in the mountains proper and only to a limited extent in Transcarpathia. Many road bridges were destroyed during World War II and replaced by low-capacity temporary wooden bridges, most of which are probably still in use. For this reason most of the highways listed above, and nearly all alternate routes, may be unusable for heavy military traffic.

River transport is limited to timber rafting, reported to be considerable in volume on the Prut River.

There is no transmission network in the region. Drogobych is connected to L'vov in Area 2 by a 60-kv. high-tension line. Lines of 35- and 15-kv. from Drogobych supply the oilfield center of Borislav and the potassium combine of Stebnik. Small power plants are located at Drogobych (4,700 kw.) and Borislav (1,200 kw.) but it is likely that these cities obtain additional current from the large power plant at L'vov. A power plant of 25,000 kw. is planned for the Drogobych area but there is no information on its construction. The remainder of Special Forces Area 1 has only localized low-tension networks based on the output of one or several small power plants. The most extensive such network is located in Transcarpathia where high-tension lines of 35-kv. or smaller capacity connect Uzhgorod, Mukachevo, and Chust. A thermal plant of 12,900 kw. is located at Uzhgorod. There is a small thermal power plant at Mukachevo and another at Sevljus (4808N-2302E), both believed to be less than 5,000 kw., and several small hydroelectric plants with a joint capacity of 4,600 kw. near Uzhgorod. There are unconfirmed reports that Mukachevo is receiving current from the Tisza hydroelectric plant in Hungary. This transmission network probably is already connected with the sizeable Tereblya-Rikskaya (4807N-2337E) hydroelectric plant which has begun operations high on the southern slopes of the Carpathians. The capacity of this plant will be

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18,000 kw. Steel masts for transmission lines were already being erected in 1955. The Tereblya-Rikskaya development exploits the considerable difference in elevation between the Rika (Velag) and Tereblya (Talabor) Rivers (perhaps as much as 200 meters, as determined by map inspection), both flowing down the Carpathians to the Tisza River. At a point where the two rivers are only three to four kilometers apart a tunnel has been constructed through the intervening mountain range from the Tereblya River near Vulcana (4823N-2336E) to the Rika River near Nizna Bystra (4822N-2333E). A concrete diversion dam has been completed on the Tereblya River. Presumably the power plant will be located at the terminus of the tunnel on the Rika River. There is no information on the size of the reservoir which may be impounded by the dam on the Tereblya River. Since the water flow in this region is highly seasonal, the hydroelectric potential of the site can be fully exploited only if there is a large reservoir. This plant is vulnerable because the key structures--dam, tunnel, and power plant--are spread out over several kilometers.

The only other power plant in Area 2 known to be over 5,000 kw. is located at Chernovtsy, about one kilometer north of the railroad station. Its former capacity of 9,750 kw. has been exceeded as expansion of unknown proportion was reported nearly completed in 1954. A power plant of 45,000 kw. was reported completed by the Germans in 1942 at Kalush, whose main function was the supply of the Kalush area potash mines and processing plant. There is no confirmation on the recent existence or size of this plant. Stanislaw before the war had a plant of 1,000 to 5,000 kw. Since it requires at least 5,000 kw. for its principal power consumers, it is believed to have expanded this plant or to obtain current from Chernovtsy or Kalush. It is possible, however, that most of its power needs are met by industrial power plants of unknown capacity, inasmuch as it is reported to have power plants at the oil refinery and at the railroad workshops in addition to the municipal power plant, consisting of four diesels and one power train, which is located east of town and south of the main railroad station.

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A high-tension line is planned to connect L'vov to Chernovtsy and to the Unizh hydroelectric power plant which may be under construction on the Dnestr River east of Area 1.


A radio communications station of over 50 kw. is located at Stanislav, and a large aeronautical communications station is at Chernovtsy. Main broadcasting stations are at Chernovtsy and Uzhgorod, with small stations at Stanislav and Drogobych. Principal wire communications centers in this area are Chernovtsy and Stanislav, with Uzhgorod a secondary center of regional importance. The center for wire communications with Czechoslovakia and Hungary is L'vov in Area 2; the land wires, which follow the Carpathian Mountain transport routes from L'vov to Uzhgorod and L'vov to Mukachevo, meet at Chop, continue west across the border to Kosice in Czechoslovakia and to Budapest in Hungary. A second Hungarian connection goes through Beregovo and connects with the other lines, probably at Mukachevo. Both the Hungarian connections are underground cables in Hungary, and may continue underground as far as L'vov. One wire connection with Bucharest, Rumania, is located in Transcarpathia, following the route Uzhgorod-Mukachevo-Chust-Sighet (Rumania). Other lines to Rumania originate at Chernovtsy.


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## SPECIAL FORCES AREAS (S)

## LEGEND

 Rail bridges


 Highway bridges

 Tunnel

 Steep grade


Electric Power Plants

Hydroelectric

 5,000 - 10,000

 10,000 - 50,000


 over 50,000


 under construction


Thermal

 5,000 - 10,000

 10,000 - 50,000

 over 50,000

 under construction


 Transformer station


Power Transmission Lines

 60 KV Existing


 60 KV Under construction

Pipelines

 Existing

 Under construction

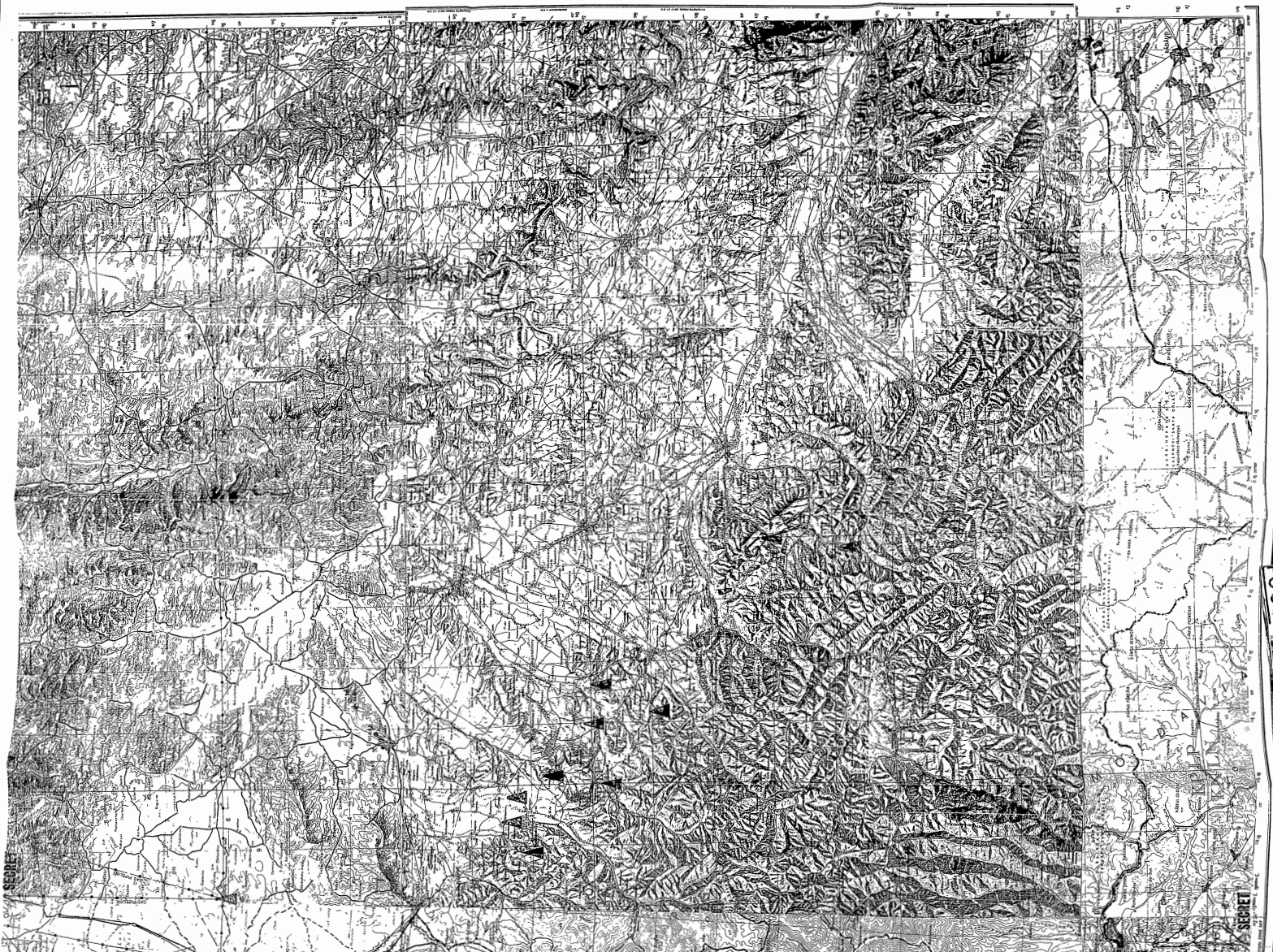
 Mines

 Oil and/or gas field

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Special Forces Area 2

This area, bordered by the Carpathian Mountains in Area 1 to the south and by the Pripet Marshes in Area 3 to the north, is important as the primary transport artery between the Ukraine and Poland and East Germany. Significant railroad connections to Czechoslovakia, Hungary, and northern Rumania also pass through the area. Its only large city, L'vov, is important as a transport and communications center and to a lesser extent as a manufacturing center. Possibilities for evasion are poorer than in the other Special Forces areas, but there is extensive cover to the north and south, and within the area itself are many small wooded sections providing suitable cover for small groups for brief periods of time. During World War II roving bands were able to maintain themselves here despite German efforts to destroy them; in the post-war period also resistance incidents on a moderate scale were recorded, some as recently as 1955.

1. Cover Areas

The terrain and forest cover of Area 2 are less well suited for Special Forces than is the case in the other areas of the Ukraine which have been selected for analysis. This is not to say that the physical factors of the region render refuge and evasion infeasible, but that greater care would have to be taken to avoid detection. In the face of a determined and sustained search, however, it is likely that the concealment available in Area 2 would prove inadequate. The fact that many parts of the area are in rather close proximity to the extensive forests of the Carpathian Mountains (Area 1) to the south, and the far-reaching swamps and forests of Poles'ye (Area 3) to the north, lessens to some extent the force of observations which are confined to Area 2 alone.

The dominant terrain characteristic throughout is provided by the undulating and stream dissected Volyno-Podol'skaya Upland, the surface of which rises in elevation and becomes increasingly more undulating from north to south. It attains some of its highest elevations a few miles southeast of L'vov (4950N-2400E) and then declines gradually toward the

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Dnestr River. The entire area constitutes a noteworthy water divide. Streams in the northern half of the area trend northward, either to the Pripet Marshes and the Pripet River, or to join the Zapadnyy Bug on its course to the Polish frontier. In the southern part, streams cut their way through the upland surface as they make their way southward to the Dnestr River. The upper courses of both northward and southward flowing streams are apt to have broad, marshy, and occasionally ponded valleys. These shallow valleys are more widely developed in the case of the northward-flowing streams, and the areas of marshland and swampland occur at close intervals in that region.

Population density is heavy throughout Area 2 with rural inhabitants numbering everywhere more than 100 per square mile. In the southwestern corner--below the line connecting L'vov with Krakovets (Krakowiec) (4958N-2309E) on the Polish border--population density exceeds 260 per square mile. Soils in the corner are fertile, and there is intensive farming of small plots combined with the grazing of livestock on carefully tended pastures and wooded patches. To the north and east population density is lower, and settlements are smaller and more widely spaced. Villages are concentrated in river valleys where they often adjoin one another in long, almost uninterrupted chains. In the north many valleys are swampy and are less densely settled. Settlements vary in size but number typically between 1,000 and 2,000 inhabitants. There are frequent market towns, transportation junctions, and light manufacturing centers where populations are greater.

The greater part of Area 2 is covered by grain fields which predominate on the rolling surfaces of the upland. Some forest patches remain on the steeper ridges and in the poorly drained lowlands. Best possibilities for concealment and evasion are found along the Roztochchya Ridge which extends in a northwestward direction from Bobrka (4938N-2418E) to Nemirov (Niemirow) (5007N-2326E) near the Polish border. Relative relief within the ridge is approximately 100 to 200 feet, and abrupt escarpments hinder the approaches. The streams, which have steep gradients and are subject to spring torrents, have cut steep-walled valleys. The most densely forested parts of the ridge



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are found about 20 miles northwest of L'vov, between Ivanovo (Janow) (5106N-2717E) and Nemirov. The main body of this forest occupies approximately 75 square miles, but it is split by several roads and a railroad. Settlements are numerous on the periphery, but only a few intrude on the inner forest; there are many trails. There are dense pine stands which provide good concealment throughout the year. Traversability on foot is generally good except where stream valleys are found. Beyond the limits of the main body of this forest there are a number of smaller forests which add somewhat to the usefulness of this area for purposes of refuge and evasion.

Between Kamenka Strumilova (Kamenka Bugskaya) (5006N-2421E) and Brody (5640N-3517E) there is another section of the general east-west band of forest in which conditions of vegetation and terrain appear to be somewhat encouraging. The area in question is flat to slightly undulating and is about 30 by 10 miles in extension. Forests are not continuous over this area but are the dominant feature of the landscape. Considerable marshland is encountered at intervals between the wooded tracts and also margining the area, reducing its accessibility. A few hard-surfaced roads, roughly aligned north-south, penetrate the area, and narrow-gauge railways are found within some of the forests. Tracks and trails are numerous. Settlements within the forests are relatively sparse, but exist wherever the land may be cultivated. Vegetation is thickest where swampy forests have developed, and offers better concealment than the dry land forests. Inasmuch as a large part of the area is perennially wet, movement on foot is often difficult.

A third area of forest cover lies southeast of Dubno (5024N-2545E) on low flatlands and rolling elevated uplands in the northeastern part of Area 2. As with the other forests of the area, there are no broad stands of continuous and unbroken forest. There is much swampy terrain and settlements are quite sparse. Probably the most significant feature of the area is that it is not penetrated by a single hard-surfaced road, although the customary tracks and trails are scattered throughout.

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Forest cover is available elsewhere in Area 2, but it is either quite fragmentary or isolated and occurs where settlements and the road network are quite dense. Wherever forests occur in the midst of areas of intense cultivation, the trees are likely to be well tended, widely spaced, and free of undergrowth.

Movement on foot in Area 2 encounters most serious obstacles in the swampy terrain along stream courses, particularly during spring thaws. Flooding in the spring is extensive and there is fog which limits visibility and hinders movement. Freezing conditions in the winter make the area everywhere accessible except where local obstacles are encountered especially on the higher parts of the upland.

The western part of Area 2, along the Polish frontier, is strictly controlled by frontier troops and the population is under surveillance for many miles east of the border. Interior troops of the MVD and units of the Soviet Army are concentrated in the L'vov area.

## 2. Population and Resistance Factors

Two important ethnic groups are found in Area 2--Ukrainians and Poles--as well as two less numerous elements--Jews and Russians. The number of Jews who escaped liquidation during the German occupation is small, and they no longer form a significant group. The number of Russians is unknown, although it has undoubtedly increased sizeably under Soviet rule, particularly in administrative centers such as L'vov. There is apparently little to distinguish the attitudes of the Ukrainians and Poles in this area from those in Area 1, although possibilities for opposition to the Soviet regime have been more limited because of the area's heavier population, less extensive stretches of natural cover, and better developed communications and transportation facilities.

During World War II the German armies depended on the transportation facilities running through Area 2 for transmitting supplies to their armies operating on the Ukrainian front. As a result they made every reasonable effort to keep the area free of partisan bands. Nevertheless, despite the

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relatively open character of much of the terrain and the lack of large wooded sections, Ukrainian partisans carried on extensive operations. German observers reported numerous bands; and rail lines, highways, and communications facilities were frequently cut.

Numerous resistance incidents have been reported after World War II including several as recently as 1955. Resistance activities have been concentrated primarily in a wooded belt extending from the Polish frontier southwest of Rava Russkaya (5015N-2336E) to the southeast beyond L'vov, to the village of Bobrka, and into Area 1. A second concentration of resistance incidents has been reported in the wooded area running from Bobrka, to Zlochuv, to a point south of Brody.

### 3. Economic Vulnerabilities

L'vov is the largest city in the western Ukraine, numbering nearly 400,000 people. It is an important center for rail, road, and telecommunications and a sizeable manufacturing city with oilfield equipment, precision instruments, radio and telegraphic equipment, agricultural machinery and equipment manufacturing plants, and reportedly a steel plant under construction, in addition to textiles and agricultural processing industries. The status of a planned motor vehicle assembly plant with a capacity of 15,000 units a year is unknown.

The most important rail connection between Poland and the Ukraine runs west from L'vov to Przemysl, Poland. It is broad-gauged and double-tracked in the USSR. Parallel standard and broad-gauge sectors are found in Poland. Major trans-shipment facilities are located at Przemysl and Zurawica; their capacity was estimated at 21 trains per day in 1950.<sup>1</sup> This is a heavy-duty line carrying large amounts of Krivoy Rog ore to Upper Silesia and considerable amounts of Silesian coal to the western Ukraine and Belorussia. A second double-track connection between Przemysl and the USSR crosses the border at Nizankowice (Nizhankovitse) (4941N-2248E) and goes south to Chyrow (4933N-2452E), end of the double-tracked sector (Area 1), then east through Sambor, with single-

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track connections between Sambor and L'vov and a single-tracked by-pass around L'vov from Sambor through Stryy (Area 1) to Ternopol' (4933N-2535E). The parallel standard- and broad-gauge tracks and main trans-shipment facilities are in Poland.

A second border-crossing point is located on the rail line going northwest from L'vov through Rava-Russkaya, which has trans-shipment facilities. A single-track standard-gauge line going northwest from Rava Russkaya provides a fairly direct connection with Warsaw and with the Polish Baltic Sea ports. Another single-track, standard-gauge line goes east from Rava Russkaya to Jaroslav, Poland, on the Przemysl-Krakow line. This line, together with the Rava Russkaya-Krystynopol' (5024N-2412E) rail sector, links southern Poland and Kovel' (Area 3). The Rava Russkaya-Kovel' connection is variously reported to be standard-gauge and broad-gauge.

A third international connection from L'vov goes southwest through Sambor (Area 1). There is some question whether this line is in operation. It was formerly a standard-gauge line which ceased to operate at the end of the war. The sector across the Carpathians lying in Area 1 is shown on recent maps to be in operation and is reported to be now of Soviet-gauge. It is likely that the sector from Sambor to the Carpathians has been reconstructed or is in the process of reconstruction, inasmuch as the Transcarpathian line has no economic or military justification unless it is connected to L'vov.

Further east two rail lines proceed from L'vov south through Stryy and southeast through Stanislaw (4856N-2442E), providing connections to Transcarpathian routes going to Czechoslovakia, Hungary, and Rumania in Area 1. These Transcarpathian routes can also be reached through Ternopol', by-passing L'vov, but only by a very circuitous route.

L'vov has numerous connections with the interior of Russia which radiate in a fan-shaped manner, with the southernmost route, double-tracked in this area and possibly throughout, curving along the Volyno-Podol'skaya Upland to the seaport of Odessa, and the westernmost route, single-tracked, curving

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along the Russo-Polish border to the vital trans-shipment center of Brest (north of the study area). In between these two routes run the L'vov-Rovno (5038N-2615E) double-track line, with single-track connections to Belorussia, and the single-track Ternopol'-Shepetovka (5011N-2703E)-Mozyr (5203N-2916E) line, which provides connections to the Moscow and Leningrad regions. The L'vov-Rovno line is used as a sector in one of two main rail routes between southern Poland and the L'vov area on the one hand and the central and eastern Ukraine on the other. The L'vov-Ternopol'-Zhmerinka (4903N-2806E) line (part of the L'vov-Odessa line) is used as a sector in the other main rail connection between the same areas.

Since all of Area 2 was Polish territory before the war and since the trade relations between Russia and its western neighbors have been revolutionized by the political consequences of the war, the rail connections between L'vov and the central and eastern Ukraine are indirect and generally inadequate in capacity. There is no direct through route from L'vov to Kiev or from L'vov to the Dnieper Bend and the Donbass. Most traffic between L'vov and these areas is believed to go via Ternopol', where alternative routes are available, a single-track line going northeast to Shepetovka and the main double-tracked line continuing east through Proskurov (4925N-2700E).

The L'vov-Volynskiy coal basin is currently being developed. There is no information on the exact location of coal mines in Area 2. Some are undoubtedly near Dobrotvor (5014N-2422E), site of a sizeable new coal-burning power plant. Although no large output is expected in this area, coal production will be of great regional importance in relieving the area of the need for imports of Polish or Donbass coal and in providing a local source of fuel for locomotives and for industrial power plants. The expansion of coal output will release oil and natural gas supplies for higher-priority uses elsewhere.

A gas pipeline links L'vov with the gasfields of Dashava (4915N-2401E)

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in Area 1. Natural gas from Dashava is supplied to Poland in limited amounts. The gas pipeline to Poland crosses the border west of L'vov at the village of Medyka (4949N-2257E).<sup>2</sup> It seems likely that it follows the alignment L'vov-Medyka, since it goes due west from Medyka to Przemysl, although it is possible it is a separate line also originating at Dashava. A natural gas pipeline from Dashava through Minsk to Leningrad with branches to Vilnius and to Riga will be constructed during the current five-year plan. It may be an extension of the Dashava-L'vov pipeline, although it is more likely that a separate pipeline will be needed to provide adequate capacity. These pipelines are highly vulnerable targets whose destruction would have serious effects on the economy of the regions served by them. The Dashava-L'vov pipeline operates on natural gas pressure. With the completion of the Dashava-Leningrad pipeline, Leningrad will derive 80 per cent of its fuel supply from natural gas (not all of it supplied from Dashava, as some of it originates in the shale fields of Estonia). Gas supplies the city of L'vov with its main source of fuel, and supplies the L'vov power plant, by far the largest in the western Ukraine, which sends current throughout much of Area 2 and also to important industrial installations in Area 1. A pipeline from Dashava to the Ukrainian capital of Kiev has been in operation since 1948. Its exact alignment is not known but it probably cuts through the southeastern corner of Area 2.

An oil pipeline connects L'vov to Stry and the oilfields in Area 1. A small oilfield is located just north of L'vov. An oil refinery in L'vov, destroyed in World War II, is probably again in operation.

The L'vov power plant, destroyed during the war, was reconstructed and expanded to a probable current capacity of 60,000 kw. It uses both coal and natural gas as fuel, but natural gas is believed to be the main source of power. It is connected by a 60-kv. line to the oilfields and refineries and potash plants of Area 1. It is also believed to be connected with the sizeable power plant at Dobrotvor. There is no definite information on the size of the Dobrotvor power plant. The first generator

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was in operation in 1955 and a second was being assembled. At that time it was supplying the mines of the new coal basin, nearby towns and several large agricultural districts. A workers' settlement had been built at the construction site. These facts indicate that the plant will be sizeable, certainly at least 10,000 kw. This plant is reported connected to the L'vov transmission network, although the exact alignment of the high-tension lines is unreported. Ternopol' is the only other city in this area believed to have a power plant exceeding 5,000-kw. capacity. An old thermal power plant north of the railroad station in Ternopol' was being reconstructed in 1947 and a new thermal power plant northeast of the railroad station was under construction, which was to be put into operation in 1948.

Except for the periphery of L'vov and the connections between L'vov and the oilfield area to the south, there is no transmission network in Area 2. There are plans to connect L'vov eventually to Kiev and through Kiev to the Dnieper-Donbass transmission network but no reports of construction. Another planned connection is from L'vov to Chernovtsy (4818N-2555E) to the Unizh hydroelectric plant probably under construction on the Dnestr River east of Area 1.

L'vov is the transport hub of the western Ukraine for highways as for railroads. All but one of the important highways in Area 2 pass through L'vov. Most important are the east-west routes between L'vov and Poland on one hand and L'vov and the central Ukraine on the other. Also significant are several highways crossing the Carpathian Mountains, all but one of which meet at L'vov.

The two main highways leading east from L'vov are the L'vov-Dubno-Rovno (Area 3)-Kiev and L'vov-Ternopol'-Vinnitsa (4913N-2829E), with connections to Kiev and to the Dnieper Bend. The first of these is asphalted in Area 2 and reported in excellent condition. The second is paved with stone blocks as far east as Zlochev (4948N-2454E) but is tar-bound macadam most of the way.

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West from L'vov the main highway to Poland, with a tar-bound macadam surface, goes through Gorodok (Grodok Jagiellonski) (4948N-2339E) to Przemyśl in Poland. A second route, of poorer construction, particularly as it approaches the border, runs just to the north, crossing into Poland near Krakowiec (4958N-2310E). A third highway route to Poland runs northwest from L'vov, going through Rava Russkaya. Several road approaches to Czechoslovakia and Hungary originate at L'vov. Roads go southwest through Sambor, south through Stryi, and southeast through Stanislaw, all in Area 1. All of these approaches cross the Carpathian Mountains in Area 1 and service Russian Transcarpathia. All were formerly surfaced mainly with gravel or crushed rock but it is possible that they have been reconstructed and re-surfaced with concrete, inasmuch as all three have been rebuilt in Area 1 and at least partly re-surfaced with concrete.

The only significant highway not passing through L'vov runs through Ternopol' in a north-south direction. In Area 3 to the north it connects with Lutsk and Rovno and in Area 1 to the south it leads to Rumania through Chernovtsy. It is the westernmost interregional through route wholly in Soviet territory, continuing past Lutsk to Brest.

A highway running northeast from L'vov to Lutsk can provide an alternate route for the L'vov-Rovno highway and can serve as a sector, together with the Lutsk-Brest highway, in the most direct north-south road feasible from L'vov.

L'vov is the center for both radio and wire communications in the western Ukraine. It has powerful international and domestic radio communications stations as well as international and domestic broadcasting stations and a large aeronautical communications station. The only other significant communications center in Area 2 is Ternopol', which has a powerful international communications station as well as domestic radio-communications facilities and a small broadcasting station which is a satellite of the L'vov station. It is possible that some of the larger international communications stations,



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including Ternopol', are used for jamming.


Three main wires lead west from L'vov to southern Poland, to Tomaszow Lubelski (5027N-2326E), Przemysl, and Jaroslaw (5002N-2240E), respectively. Two wires, both believed to be underground cables, go southwest from L'vov over the Carpathian Mountains leading directly to Czechoslovakia, Hungary, and Central Europe, and less directly providing wire connections with Rumania, which however has other connections further east and south. From L'vov wires and cables lead directly to the main centers of the Ukraine, Belorussia, and the European RSFSR.<sup>3</sup>


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## SPECIAL FORCES AREAS (S)

## LEGEND

 Rail bridges

 Highway bridges

 Tunnel

 Steep grade


Electric Power Plants

## Hydroelectric

 5,000 - 10,000

 10,000 - 50,000


 over 50,000


 under construction


## Thermal

 5,000 - 10,000

 10,000 - 50,000

 over 50,000

 under construction

 Transformer station

## Power Transmission Lines

 Existing


 Under construction

## Pipelines

 Existing

 Under construction

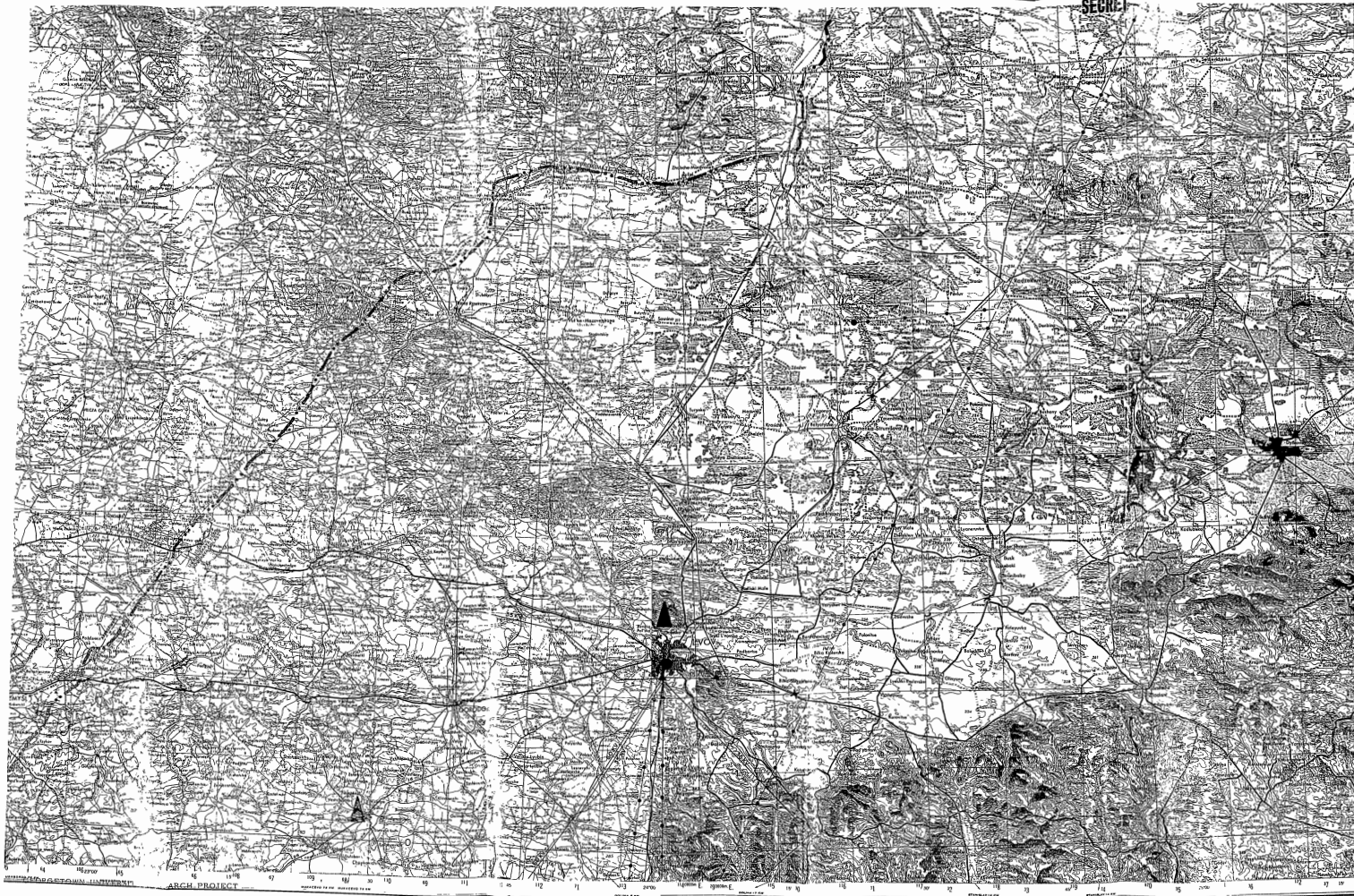
 Mines

 Oil and/or gas field

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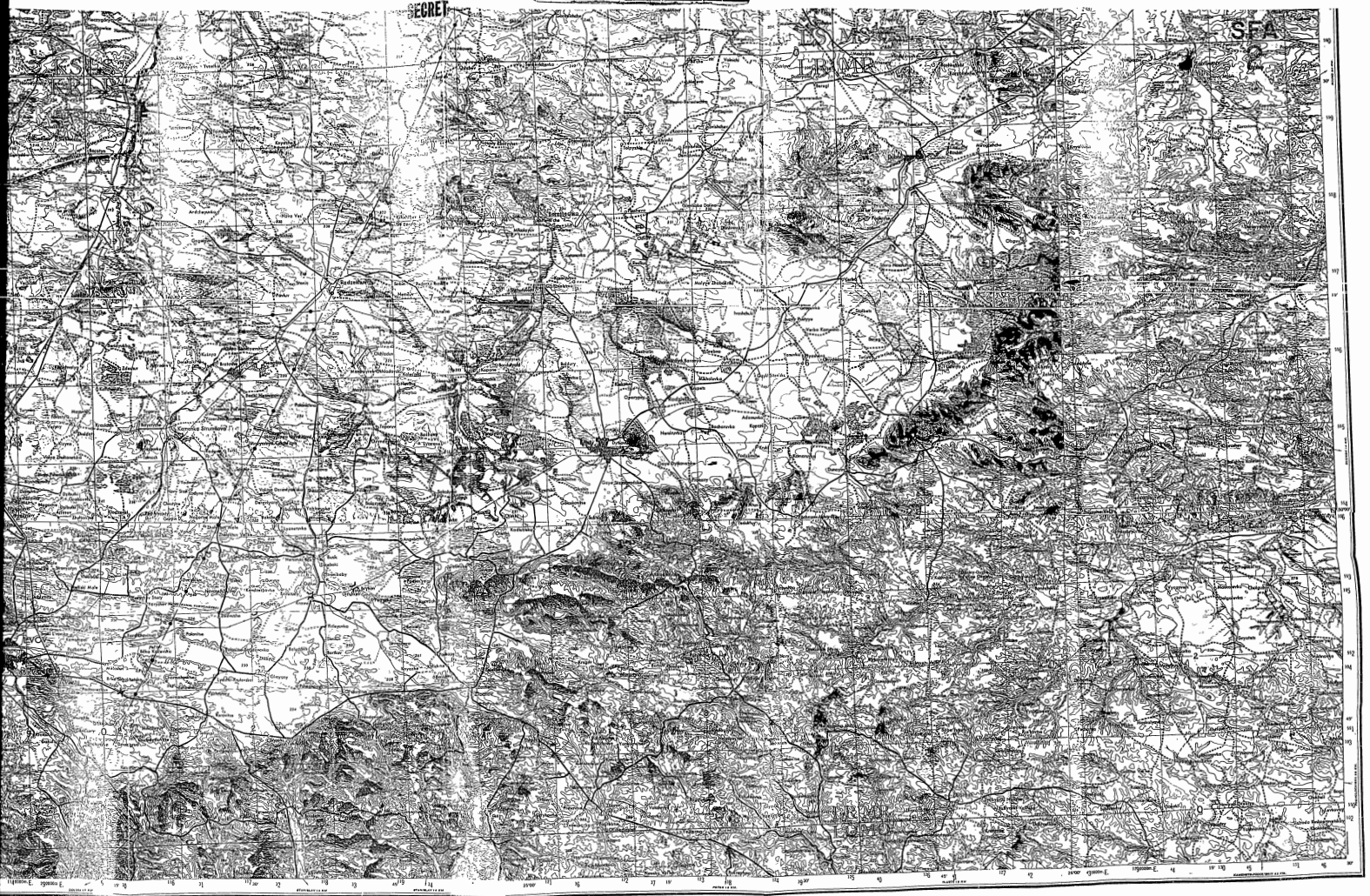
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Special Forces Area 3

This swampy and largely forested area at the southern limits of the Pripet Marshes is sparsely populated and relatively undeveloped. It is crossed by many north-flowing streams (Sluch', Goryn', Styr', Stokhod, and others) which run through flat, broad lowlands covered with marshes. Away from the streams, swamps and marshes alternate with dryer stretches which may be wooded or serve as sites for small farming villages. There is little economic activity in this area other than lumbering and some agriculture. Its main value to Special Forces, other than the excellent concealment opportunities it affords, lies in important railroad lines connecting Poland and East Germany with the Ukraine. Of lesser interest economically are north-south lines connecting the western Ukraine with the Baltic area and with central Russia. The area was the scene of considerable partisan activity in World War II; occasional resistance incidents have continued in the post-war period. Soviet efforts to collectivize the area have not been completely successful, and numerous farmers have been deported for refusal to join kolkhozes. Although a number of relatively loyal settlers have been brought into the area, there remain many Poles and Ukrainians who hold important grievances against the regime.

1. Cover Areas

The possibilities for refuge and evasion are excellent throughout most of Area 3. The dominant landform, accounting for about three-fourths of the total area, is the nearly level, poorly drained, and heavily forested plains of Poles'ye, constituting one vast flood plain. In the remaining part of Area 3 the terrain rises to the Volyno-Podol'skaya Upland in the south, the demarcation between lowland and upland lying somewhat north of Vladimir Volynskiy (5050N-2420E)--Lutsk (5044N-2520E)--Rovno (5038N-2615E). Although small forests, swamps, and marshes are encountered on the gently rolling upland, this section will be excluded from consideration because of the much more favorable conditions of vegetation and terrain which prevail in Poles'ye only a few miles to the north.

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Marshes, moory tracts, and swamps are encountered almost everywhere over the thousands of square miles of flat lowlands in Ukrainian Poles'ye. A few islands of higher ground exist here and there as well as many sandy areas bearing pine-clad dunes. Railroads and the more important roads are confined to the higher ground of low ridges, natural levees, or the relatively well-drained routes along river banks. Meadowlands, which may be free of surplus water in the summer, are important to the economy of the area. The Pripet River, lying to the north in Belorussia, provides the primary avenue of drainage for the entire lowland area. However, because differences in elevation are so slight, the numerous and extensively branched north-flowing affluents of the Pripet River follow broad and unstable channels in their winding course across areas of extensive marshland. Interstream areas are also very low and are largely occupied by marshes and swamps. The density of the waterway network is increased by a large number of drainage ditches and canals. Even a slight rise in the water level causes flooding over wide areas; flood conditions are most severe during and immediately after spring thaws, but autumn rains also contribute to the broadening of watery landscapes.

Possibilities for concealment are so uniformly available and excellent in Poles'ye that it is unnecessary, in terms of forest cover, to limit Special Forces to any particular section. Much of Poles'ye is classified as having a forest density of over 40 per cent, and in individual forests the density of cover is sometimes as much as 80 per cent. Mixed forests of evergreens and broadleaves prevail throughout, and scrub growth, in some cases sufficiently continuous to provide concealment, is often found in clearings. Dry forests are generally thinner and with less undergrowth than the dense swamp forests. Both provide suitable concealment. A coarse, flat grass which attains a height of several feet grows throughout the marshy areas. It is harvested during the summer and early autumn. Cultivated fields are confined to the higher ground. Fire-breaks criss-

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cross the forests and forest ranger huts are scattered throughout, but they are generally many miles apart.

The only important towns in the area are Rovno, Lutsk, Vladimir Volynskiy, and Korets (5037N-2710E)--all lying in the southernmost edge of Poles'ye--and Kovel' (5113N-2444E), straddling the Tur'ya River in the southwest where swamps and marshes are relatively limited. Other less important towns are found along the Goryn' and Sluch' Rivers and in the extreme west and south. Small sections in the north as well as the entire northwestern corner where swamps and marshes are almost continuous are nearly completely uninhabited. Elsewhere there are innumerable small settlements located wherever the ground rises high enough above the level of the marshes to allow for marginal farming. A typical village consists of about 40 households extending in a double row along a slight elevation bordering a swamp stream. Small, separate plots near the village are planted to potatoes or grain, or in less favorable places are devoted to fodder crops or the grazing of cattle. Communications with other villages are very poor, and there are only occasional contacts with the outside world.

Movement on foot throughout the vast swamplands of Area 3 is generally very difficult and locally impossible. There is no regular pattern in the intermingling of the dry and swampy forests, marshes, and moors. Corduroy roads, dirt tracks, and other lesser roads are fairly numerous, and trails and paths are encountered almost everywhere; in fact there is no part of the area which cannot be penetrated, or at least approached, by some form of track or trail. During the spring floods, and to a lesser extent during the autumn floods, many of these primitive communication routes are submerged and movement, except by water, comes to a standstill. Mobility is greatest in winter after the ground has had sufficient opportunity to freeze. Skis and sleighs are in wide use by the populace in this season and movement at will is possible throughout. Some drying-out

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occurs in the hot and humid summers.

In addition to the hazards and obstacles already indicated, personnel committed to Poles'ye would have to be conditioned to a number of unusual and trying circumstances. Thus, despite the perpetual moistness of the area, water suitable for human consumption is not plentiful, but can generally be obtained in dryer areas by digging to a depth of several feet. Even then the water obtained requires treatment. Fish are abundant but other sources of local food supply are scarce in this area of marginal subsistence. Mosquitoes and other insects infest the area and add their annoyance to the warmth and humidity of the summer season. The level and monotonous landscapes of Poles'ye make orientation a problem.

Frontier troops control the Polish-USSR border in the west, and ground forces of the Soviet Army will be encountered at Vladimir Volynskiy and Rovno. Interior troop units of the MVD are also present, but their locations are undesignated. It is likely that detachments of army and MVD personnel are present in the larger towns of Poles'ye, and that others will be encountered along the major lines of communication.

## 2. Population and Resistance Factors

Area 3 consists of the formerly Polish province of Volynia, now divided between the Rovenskaya and Volynskaya oblasts. Although until recently a part of Poland, the area's population has always been predominantly Ukrainian. Poles constitute less than 10 per cent of the total. In scattered places there are occasional Jews and Germans who escaped liquidation or deportation during World War II. Their numbers, however, are small.

During World War II large partisan bands--both Ukrainian nationalist and Soviet Russian--were active in the area. Ukrainians were concentrated in a quadrangle bordered by the towns of Kovel' (5113N-2444E), Lutsk, Kostopol' (5053N-2627E) and Vladimirets (5125N-2608E). Initially they occupied the area with the tacit permission of the Germans. However, when they were later ordered to disband they refused to do so and continued to control the more remote sections. To the north and east, Soviet partisans were the dominant



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group, controlling almost the entire region east of the Stokhod River and north of the 51st parallel.

After World War II Soviet authorities attempted to collectivize the farms in the area and to remove the most dissident elements. Large numbers of Poles were repatriated, and numerous Ukrainians were deported to other parts of the Soviet Union. Nevertheless, occasional incidents of resistance have been reported, suggesting that anti-Soviet elements still remain. The most important center of anti-regime activity in recent years has been the upper valley of the 'Styr' River northeast of Lutsk.

### 3. Economic Vulnerabilities

The largest cities in this area, Kovel', Rovno, and Lutsk, are really no more than towns serving as centers for their agricultural and lumbering hinterlands. Rovno and Lutsk manufacture some agricultural equipment. Kovel' is a rail transport hub with rolling stock repair facilities.

Kovel' is the principal rail center in Area 3. Two lines from the central and eastern Ukraine converge here, one of these being the mainly single-track line from Kiev and the second being the double-track line through Rovno and Fastovets (5004N-3002E) to the Dnieper Bend and Donbass areas.\* The Kovel'-Rovno-Fastovets line is an important route for freight traffic between the Ukraine and Poland and could be a useful substitute for east-west international routes further north. The main connection through Kovel' with Poland lies north of the Ukraine at Brest. Two other connections with Poland are within Area 3. One of these runs due west from Kovel' to Lublin (Poland) with transloading facilities in Dorohusk (5110N-2350E) on the Russian side. (Reports of facilities at Kovel'<sup>1</sup> are not corroborated by information on both broad-gauge and standard-gauge tracks extending to Kovel'.) A second connection with Poland runs from Vladimir Volynskiy to Zamoszcz (Poland). This line may not be operable as the bridge across the

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\* This line is reported single-track but with a double-track roadbed from Lutsk to Brest in NIS 26, USSR, Sec. 31, "Railroads," November 1950 (ID 935103) (C).

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Bug River was destroyed and may not have been rebuilt. The rail sector from Brest to Kovel' could also serve as part of the westernmost north-south line in the Ukraine which continues south of Area 3 to L'vov. A second basically north-south line also going to L'vov passes through Rovno further east. Much of the domestic traffic on all these lines is timber and lumber bound in a southeastward direction to the Central Ukraine and to the Donbass. The main exports from the Ukraine to Poland are believed to travel over rail lines in Area 2, although some Ukrainian wheat may go through Kovel' to Poland by way of Lublin and Brest. The terrain being generally level, the main obstacles surmounted by the rail lines are the extensive swamps and the numerous wide, shallow rivers. Rail lines cannot be easily interdicted through their fuel supply inasmuch as it could be obtained either from Poland on the west or the Donbass on the east and will be obtained locally in the future.

Rivers in this area are used to some extent for rafting of timber but are of no importance as transportation arteries for other products.

The best and most important highway in Area 3 runs from Brest on the Polish border just north of this area through Kovel', Lutsk, and Rovno to Kiev (Area 4). It has an asphalt surface in good condition most of the way. The Kovel'-Rovno sector is stone. Also important is the highway connecting Rovno and L'vov (Area 2) which provides the shortest east-west approach from Kiev to L'vov and southern Poland. The short highway sector between Dubno (5053N-2721E) on the L'vov-Rovno highway and Lutsk has a double significance. It is reported to be used for long-distance traffic as a bypass for the Lutsk-Rovno sector of the Brest-Kiev highway, which was in poor condition some years back. It is also a sector in the north-south route Brest-Lutsk-Dubno-Ternopol'-Rumania, the westernmost north-south interregional route wholly within Soviet territory. Also from Lutsk, which is the main highway center in the area, a highway goes due west to Vladimir Volynskiy and Poland and another route goes southwest to the important city of L'vov. The former is of stone block construction and in good condition. There is

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no information on the status of the Bug River bridge at the border. Except for these routes and for limited sectors of roads on the peripheries of the larger towns, the area has few routes capable of taking heavy military traffic and no routes which are usable at all seasons. Most highway bridges are temporary wooden structures, some of which are found even on the best highways. The so-called all-weather roads are limited to light traffic in spring and fall periods and are occasionally blocked by snow in winter.

Information which undoubtedly antedates the initial operation of the Dobrotvor (5014N-2422E) power plant indicates that wood is an important source of power, contributing 32 per cent of the electric energy in Rovno oblast and 27 per cent in Volyno oblast.<sup>2</sup> Oil provides 11.4 and 45.7 per cent of the electric energy of the two oblasts respectively. Coal provides 38.5 per cent of the energy in the Rovno oblast and 18 per cent in the Volyno oblast. The remainder of the electric energy, 18 per cent and 9 per cent, respectively, is derived from natural gas. No power plant exceeding 5,000 kw. in capacity is known to be operation in Area 3. There are no regional transmission networks.

The Dashava-Minsk-Leningrad gas pipeline, to be constructed during the current five-year plan, will pass through this area. Its exact alignment is unknown. There is no information on possible supply of the main towns in this area with gas from this pipeline.

Mineral exploitation other than local peat-cuttings is limited to piezzo-electric quartz found near Novograd-Volynskiy (5036N-2737E) (in Area 4, on the eastern border of Area 3) and newly opened coal mines. The quartz deposits may be Russia's largest source of crystals of piezzo-electric quality. The coal mines in the so-called L'vov-Volynskiy coal field have been developed only recently and their location in Area 3 is uncertain. These coal mines, although inconsequential in the over-all Soviet production, are of value to this region in freeing it from coal imports from Poland or long coal hauls from the Donbass.

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Lutsk and Rovno are regional communications centers, both having broadcasting stations and radio communications stations. Kovel' is the main wire communications center for the region but of limited importance as the principal international wires pass further south through L'vov or further north through Brest.


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## SPECIAL FORCES AREAS (S)

## LEGEND

 Rail bridges

 Highway bridges

 Tunnel

 Steep grade


## Electric Power Plants

## Hydroelectric

 5,000 - 10,000

 10,000 - 50,000

 over 50,000

 under construction


## Thermal

 5,000 - 10,000

 10,000 - 50,000

 over 50,000

 under construction

 Transformer station

## Power Transmission Lines

 Existing


 Under construction

## Pipelines

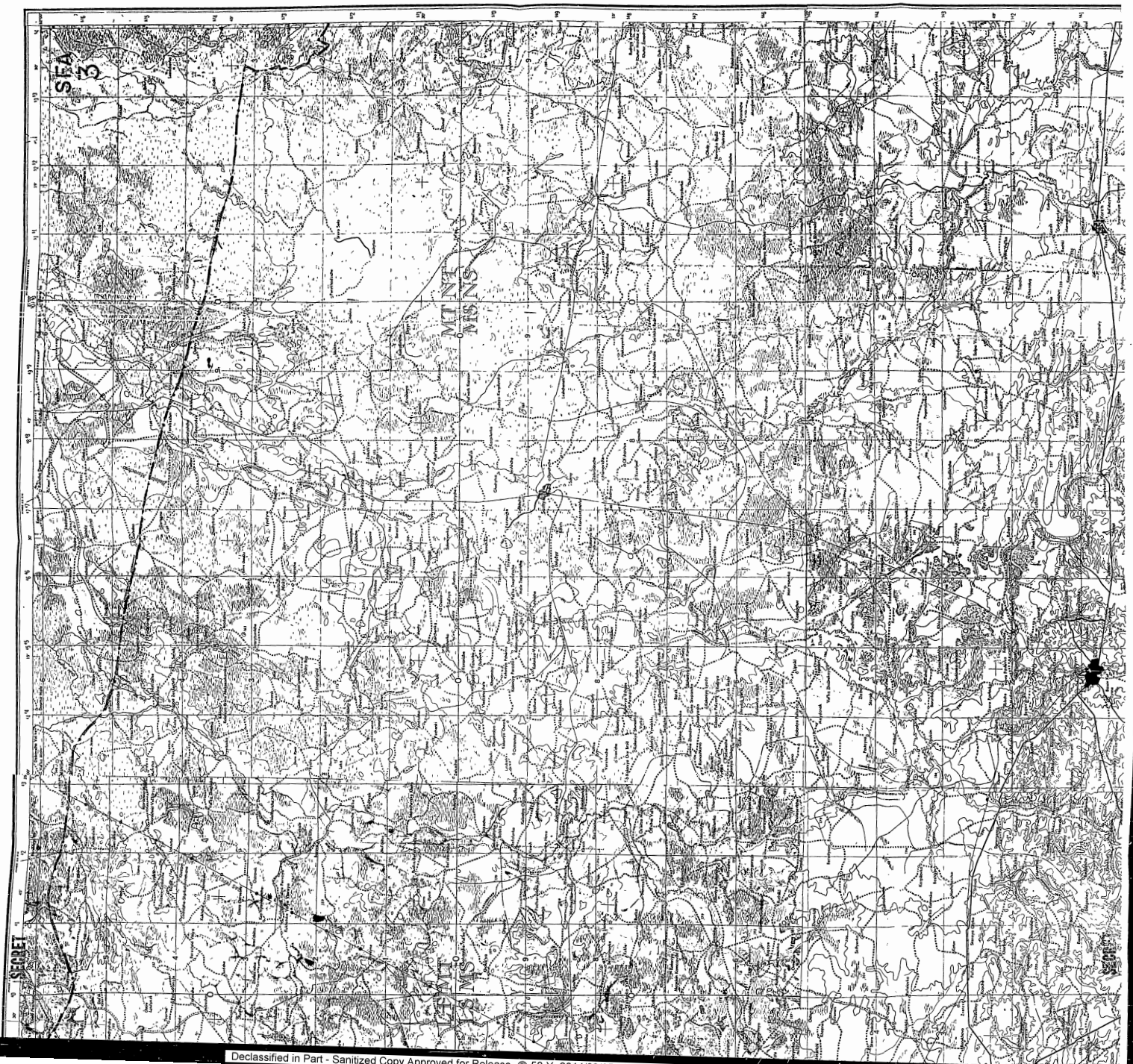
 Existing

 Under construction

 Mines

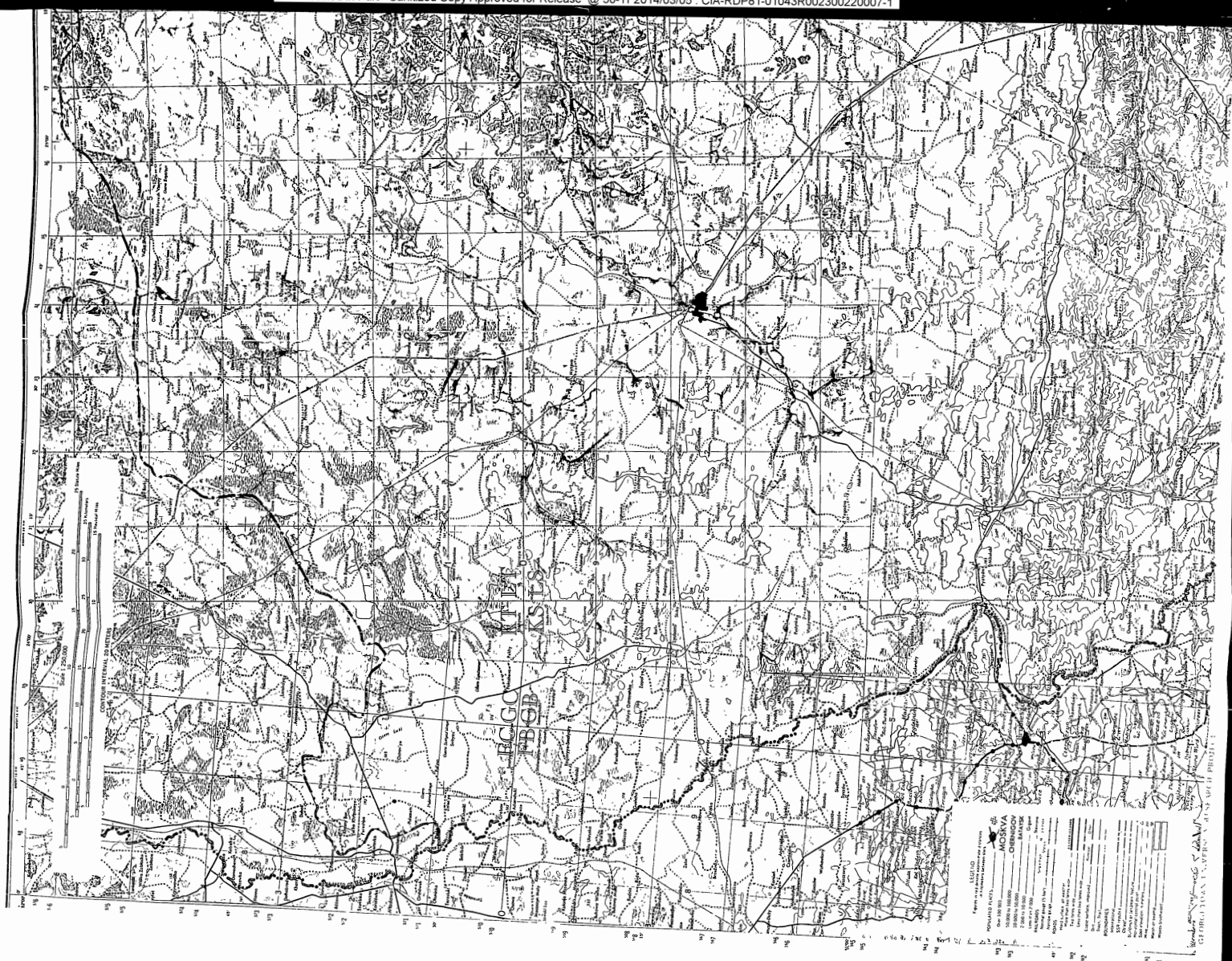
 Oil and/or gas field

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Special Forces Area 4

Included in Area 4 is the central section of Poles'ye, the swampy valley of the Dnieper and Desna Rivers and the northeastern corner of the Volyno-Podol'skaya Upland. In Poles'ye variations in elevation are slight although there are occasional islands such as the Ovruch Ridge rising several hundred feet above the lowland. The area is heavily forested in its northwestern corner where possibilities for concealment and evasion are excellent.

In the Dnieper-Desna valley there are widespread marshes interspersed with forest patches which also offer suitable cover for Special Forces. In the Volyno-Podol'skaya Upland conditions are less suitable, although small groups might find temporary shelter in occasional woods.

The only city in the area serving as more than a local center for farm commodities is Kiev--the administrative center for the Ukraine, an important transport and communications hub, and a primary industrial center. Also of interest to Special Forces are important east-west rail lines, two gas pipelines to Kiev, and the Dnieper River which carries significant amounts of freight.

The populations of the area is predominantly Ukrainian although there are a number of Belorussians in the north, occasional Polish villages in the center and south, and important Jewish elements in some cities and towns. The Ukrainians have traditionally been strongly aware of the differences separating them from the Russians, and during World War II under the German occupation exhibited a considerable amount of nationalist feeling. However they have been less active than the Ukrainians in the western, newly acquired districts, and there have been few resistance incidents since World War II.

1. Cover Areas

Area 4 includes a variety of landforms within its limits. It is drained by the Dnieper River valley which crosses the eastern portion of the area from north to south. The river is much enlarged upon receiving the Pripet River about 45 miles north of Kiev, and the Desna, a left bank tributary, directly at Kiev. Considerable marshy terrain margins the Dnieper throughout

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most of its course, and the triangle between the Dnieper and Lower Desna is almost completely swamp-covered. The area east of the Dnieper is occupied by the Dnieper Lowland, and this landform is maintained for a brief distance west of the river in the area north of Kiev. The southern part of Area 4 west of the Dnieper is occupied chiefly by the Volyno-Podol'skaya Upland, consisting for the most part of low rolling hills which gradually descend toward the north and east. In the northwestern part of the area the marshy and forested lowlands of Poles'ye are the dominant landform.

Opportunities for concealment exist in several widely separated sectors of Area 4, but the most extensive and continuous forests are found in Poles'ye in the northwest. Here a band of forest, averaging about 25 miles in width, follows the Belorussian border for about 75 miles from west to east and continues northward into Belorussia and west into Area 3. In general the conditions which prevail here are similar to those described in Area 3, although seasonal ground conditions improve somewhat from west to east. In some cases the forests of Poles'ye have been burned-over or cut-over and may not have regained their original density. In general throughout the area enough forest cover and other favorable concealment features prevail to provide against detection and discourage pursuit. The Ovruch ridge represents an unusual and mostly unforested break in the surrounding lowlands of Poles'ye. This island of upland-terrain occupies about 250 square miles and reaches an elevation greater than 1,000 feet.

A considerable number of small forests lie on both banks of the Dnieper River, and in some cases occur on poorly drained and difficult terrain. The best example is found in the interstream area near the confluence of the Desna and Dnieper Rivers north-northeast of Kiev. These forests are discontinuous and fragmented and lie in a densely populated area within easy reach of Kiev, the largest of Ukrainian cities (population 991,000). Nevertheless, the forests are probably suitable as temporary cover areas for small groups.

A band of forest approximately eight miles wide also extends along the

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right bank of the Teterev River which follows a diagonal course from southwest to northeast across the south central part of Area 4. Although these forests might also have some value as a temporary refuge, they, too, are surrounded by densely populated and highly cultivated farm lands.

The broad and unfordable Dnieper River is a barrier to movement on foot throughout its course in the area. Its flood plain is swampy and serves as an additional hindrance to movement. The Pripet and Desna Rivers are likewise unfordable and are frequently margined by marshy terrain. In the northwest in the swampy forests of Poles'ye the terrain is perennially wet, but is somewhat dryer toward the east. Seasonal variations greatly alter traversability here: in spring there are vast floods; in winter the entire area becomes solidly frozen and movement is free and unhindered, except by the density of forest growth. The upland regions in the southern part of Area 4 have few obstacles to movement on foot. Gullies and ravines occur locally, and there are some marshy areas.

Population density and the pattern of farming varies widely in the area. In the north and in the Dnieper-Desna Valley farm settlements are small, as are the fields which are cultivated. Pasturing of dairy herds is an important activity. In more remote places particularly in the extreme northwest there are individual farmsteads, fishing shacks, and woodsmen's huts. At two points, rural population density is very high. Below Zhitomir there are many large villages, the inhabitants of which are engaged in the intensive cultivation of potatoes, sugar beets, and grains. Below Kiev, extending in a belt to the southeast, is a second heavily populated district. Although population density is lower in the districts northeast of the Dnieper River, farm settlements are extensive, adjoining one another closely.

## 2. Population and Resistance Factors.

Included in Area 4 is the section of Poles'ye bordering on the right bank of the Dnieper River and extending eastward to the left bank district below Chernigov (5130N-3116E). The area has traditionally been a strong

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Ukrainian center with only small minorities consisting of Belorussians in the north, Poles in occasional rural villages, and Jews in towns and cities. During World War II there was considerable evidence of Ukrainian nationalist sympathy. At the outbreak of the war a Ukrainian nationalist, Taras Borovets', formed a nationalist republic--the Olevsk Republic--centered at the town of Olevsk (5113N-2740E). Later he was forced to withdraw, as pro-Russian partisans came to dominate the area. Nevertheless, the local population was apparently more strongly sympathetic to the nationalists than to the Russian partisans. Nationalist city governments were established at Zhitomir (5019N-2840E) and for a time at Kiev, and a nationalist demonstration was organized at Basar.

Resistance incidents in the period after World War II have been reported at only two places--in Kiev and at Berdichev (4955N-2835E), south of Zhitomir. There is no clear evidence that the incidents were sponsored by nationalists, although reports of student unrest at the University of Kiev have indicated that nationalists have been influential there.

### 3. Economic Vulnerabilities

Area 4 covers a large part of the USSR's richest agricultural region. There is little manufacturing other than the processing of agricultural goods outside of Kiev. As capital of the Ukrainian SSR, Kiev is the administrative, cultural, and communications center of a very large area. It serves as the economic center of the grain-growing black earth belt, as an important railroad hub and as a major port on the Dnieper River. Its principal industrial activities are the processing of agricultural products and the manufacture of consumer goods in which it is of national importance. In addition it has plants making precision instruments, optical equipment, radio and communications equipment, industrial machinery (mainly for chemical and agricultural processing industries), motors, motorcycles, agricultural equipment, machine tools, aircraft parts, and pharmaceuticals. It has extensive shipbuilding and river fleet maintenance facilities. An arsenal manufactures small arms and miscellaneous ammunition. Darnitsa, an industrial suburb across the Dnieper from Kiev, has a

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rubber goods factory, railroad car works, and large lumber mills and meat packing plants.

Two important east-west rail lines pass through Area 4. One of these, the Kovel' (5113N-2444E) (Area 3)-Korosten'(5057N-2839E)-Kiev-Poltava (4935N-3434E)-Donbass line, is double-tracked between Kiev and Korosten' but single-tracked most of the remainder of its route. Through Kovel' it leads west to Polish border-crossing points of Brest and Dorohusk, and in Area 3 intersects several north-south lines providing connections between the Kiev area and the Baltic. The other east-west rail line, also through Kovel', passes just south of Area 4 except in its southwest corner and at Fastovets' (5004N-3002E). It links the Donbass and Dnieper Bend regions with the northwestern Ukraine. Through Brest and several other border-crossing points it serves as a trunk connection between the Ukraine and Poland and East Germany. South and west of Area 4 it has a number of connections with the L'vov region and with the rail lines in Hungary, Czechoslovakia, northern Rumania, and southern Poland. A short double-tracked and electrified rail line connects Kiev to the Kovel'-Fastovets-Dnieper Bend line at Fastovets. The Kiev-Fastovets line and adjoining sectors of the Kovel'-Fastovets-Dnieper Bend trunk line provide Kiev with two rail links to the Black Sea port of Odessa. A double-tracked rail line going northeast from Kiev provides access to central and northern Russia. Other rail lines in Area 4, all single-tracked, are short branches and connecting links whose main function is the collection of agricultural products. The rail line Ternopol' (4933N-2535E) (Area 2)-Novograd Volynskiy (5036N-2737E)-Ovruch (5117N-2848E)-Mozyr (5203N-2916E) may be an exception, as it provides a direct route between central Russia on one hand and the East European satellites and the L'vov region on the other. There is no information on the extent of its utilization for international traffic.

Since there are no difficult terrain features other than occasional swamps and marshes, physical vulnerability of the rail lines is limited to the track itself and to numerous bridges over waterways and causeways and embankments across swamps. Coal for railroad operation comes from the

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Donbass; limited amounts may also be available from Poland.

Considerable amounts of freight are carried by the Dnieper River in this area. The port of Kiev alone was expected to handle 3.5 million tons in 1956.<sup>1</sup> The main upstream freight consists of petroleum products whereas downstream traffic is largely timber and grain. Agricultural products and, in the northern part of the area, logs, are collected along the Dnieper and its tributaries and trans-shipped by rail, with timber going mainly south and southeast and grain mainly north. Water connections between the Dnieper and the Volga via the Desna River and between the Dnieper and the Bug and Vistula Rivers via the Pripet River both originate in this area north of Kiev. Only the Bug connection is believed to convey substantial amounts of inter-regional freight, reportedly 60,000 to 80,000 tons per month each way, half of it rafted timber. Navigation on the Dnieper will be improved and at the same time physical vulnerabilities will be created by the construction of a number of multi-purpose dams which will raise water levels, generate electric power, and prevent floods.<sup>2</sup> One of these projects, just north of Kiev at the junction of the Dnieper and Desna Rivers, is under construction.

The Soviet Union's largest source of piezoelectric quartz crystals is near Novograd-Volynskiy, probably in this area, or possibly in Area 3. There is no other mineral exploitation of consequence. Some peat is mined near Kiev, but not enough to reduce appreciably dependence on fuel imports from the Donbass.

Kiev is the terminus of two gas pipelines, of which the more important one originates in the Dashava gasfields (Area 1). This pipeline, which follows approximately the route Berdichev-Kiev in this area, is 20 inches in diameter and has a capacity variously estimated at 1.5 and 3.2 million cubic meters a day. Gas provides a large and constantly growing share of Kiev's fuel needs. The other pipeline, from Romny, has an undetermined capacity.

There is no regional electric power transmission network in this area, although a high-tension line from Kiev to the Kremenchug hydroelectric plant

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now under construction on the Dnieper southeast of the area is planned. Also planned, but for the more remote future, is a high-tension line between Kiev and L'vov (Area 2). Nearly all the power-generating capacity is presently concentrated in Kiev, which has at least three sizeable plants of 25,000, 40,000, and 80,000kw. respectively, and a fourth even larger plant at Darnitsa across the Dnieper River from Kiev proper. This last plant, still only in partial operation, already has a 100,000kw capacity. All burn coal; two of the Kiev plants also burn gas in unknown amounts. There is no information that any of these plants depend to any extent on local supplies of peat and lignite. A sizeable hydroelectric power plant is under construction, to be completed by 1960, just north of Kiev at the junction of the Dnieper and Desna Rivers. Chernigov and Zhitomir both have small thermal power plants of 5,000 to 10,000kw.

Two important inter-regional highways meet at Kiev. One of these is the Leningrad-Chernigov-Kiev-Odessa highway, which within Area 4 and all the way to Leningrad has a broad concrete or asphalt surface and is one of the best roads in the USSR. Improvement of the remainder of the route to Odessa is to be completed during the current five-year plan period. The second highway, which follows the route Novograd-Volynskiy-Zhitomir-Kiev in this area and continues east to Kharkov is inferior in construction to the Leningrad-Kiev-Odessa route, but still good by Russian standards. West of Kiev as far as Zhitomir it is asphalt-surfaced, with some sectors of gravel or crushed rock beyond Zhitomir; east of Kiev to Kharkov it is believed to be mainly gravel and crushed rock. The only other highway of inter-regional significance runs north from Zhitomir through Korosten' to Mozyr' and south from Zhitomir through Berdichev to Vinnytsa (4913N-2829E). It is surfaced with gravel or crushed rock in part, but is unimproved and seasonal in some stretches. From Korosten' to Ovruch it is cobblestone in poor condition; all bridges are of wood. North of Ovruch to Mozyr' it is part dirt road and part cobblestone.

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Kiev is the center for both wire and radio communications. It has powerful broadcasting, domestic communications and foreign communications stations and a TV station. Zhitomir is a regional communications center, with both domestic and international wireless communications facilities. Brovary (5029N-3046E), almost a suburb of Kiev, has aeronautical and navigational (Dnieper River) communications stations and a broadcasting station of unknown size. A communications station is located at Novograd-Volynskiy and a small broadcasting station at Chernigov. An underground cable connects Kiev to L'vov and Eastern Europe. Other wires lead from Kiev to Odessa via Vinnitsa, from Kiev to Poland via Brest, to Leningrad and West Central Russia via Chernigov and Gomel, to Moscow, via Konotop (5144N-3142E), and to Kharkov, key communications center in the eastern Ukraine, with high capacity underground cable connections to Moscow and to the Donbass.

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## SPECIAL FORCES AREAS (S)

## LEGEND

 Rail bridges

 Highway bridges

 Tunnel

 Steep grade


## Electric Power Plants

## Hydroelectric

 5,000 - 10,000

 10,000 - 50,000

 over 50,000


 under construction


## Thermal

 5,000 - 10,000

 10,000 - 50,000

 over 50,000

 under construction

 Transformer station


## Power Transmission Lines

 Existing


 Under construction

## Pipelines

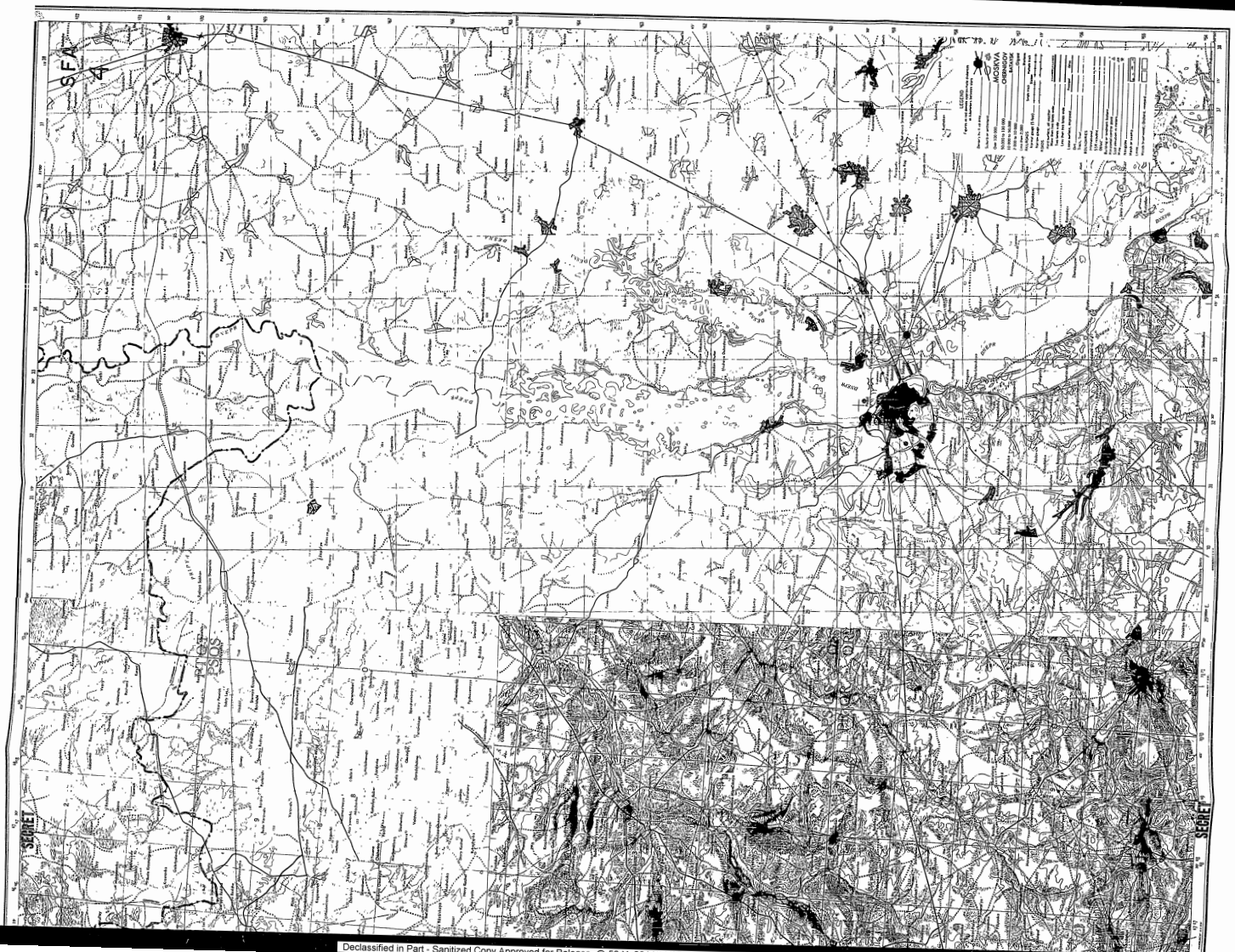
 Existing

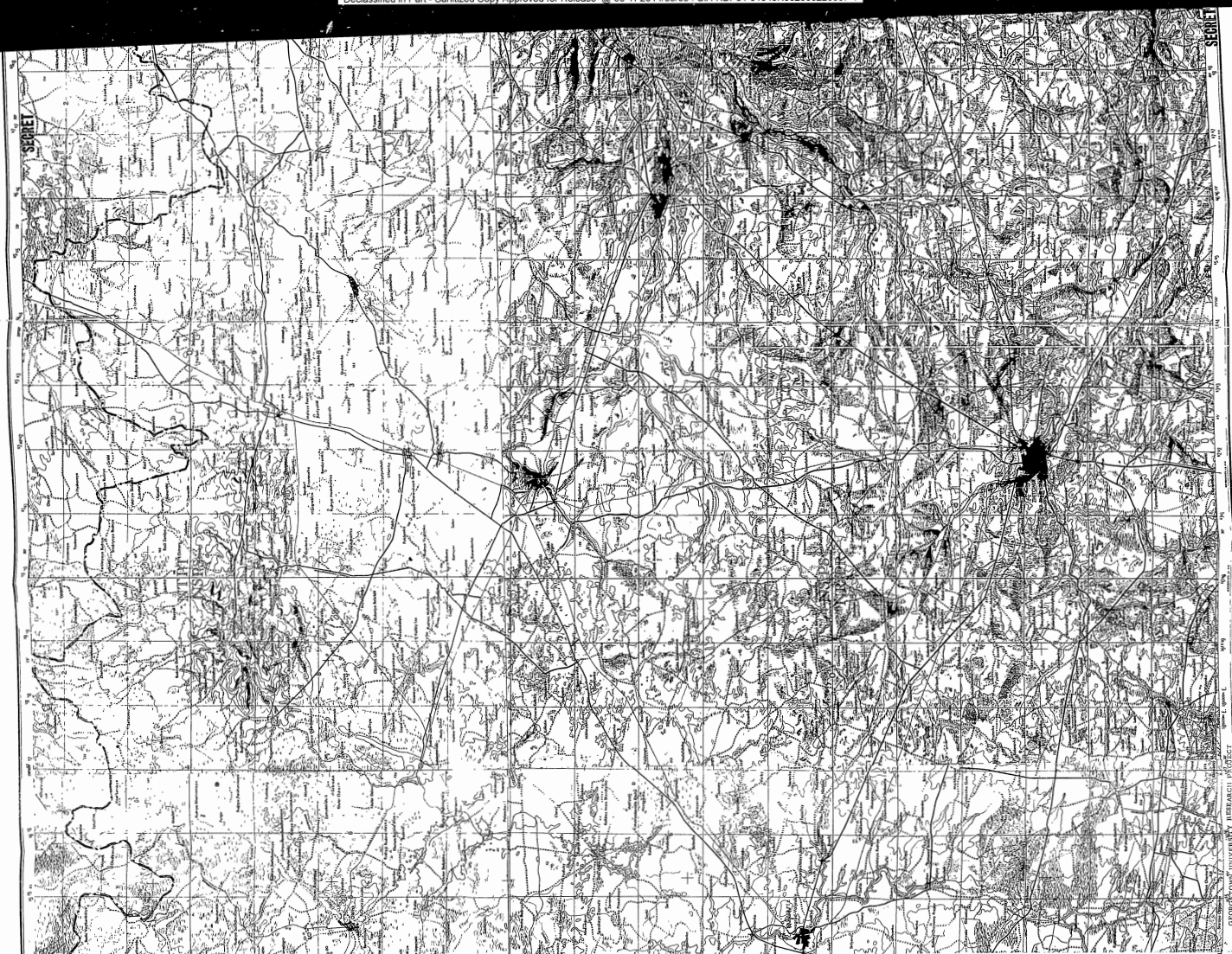
 Under construction

 Mines

 Oil and/or gas field

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## SECRET

Special Forces Area 5

The importance of the Crimea to the Soviet Union is based on its mineral resources--particularly iron ore--and on its location on the Black Sea and the consequent development of the port of Sevastopol'--located in the area--as the headquarters of the Black Sea Fleet and the main naval ship-repair center on the Black Sea. While nearly all the main mineral resources now being exploited in the Crimea lie outside the Special Forces Area proper, the railroads connecting these resources to the manufacturing centers of the Ukraine and of central Russia do pass through the area and constitute therefore the most significant target system.

The Crimean Mountains, extending along the southern coast of the peninsula, offer excellent possibilities for concealment and evasion. In places the mountains are alpine in character with escarpments, steep slopes, and many deep ravines. Troops operating in these sectors could do so only if specially trained and equipped. Forest cover is not continuous, but there are extensive dense woods especially in the southwest.

The population in the area is predominantly Russian with important Ukrainian elements in the northern half of the mountains and continuing into the Crimean steppes. Neither the Russians nor the Ukrainians have shown themselves in the past to be particularly hostile to the Soviet regime. Remnants of the Tatar population which so vigorously opposed the Russians during World War II may be found in remote mountain regions and would probably be willing to assist Special Forces.

1. Cover Areas

Area 5, which includes the southern portion of the Crimean Peninsula, possesses some of the most striking landforms to be found in the Ukrainian SSR. Along the southern coast steep mountain walls rise from a narrow coastal plain or directly from the Black Sea; in some places the mountains attain elevations of over 5,000 feet within a distance of only a few miles from the shoreline. Northward, these mountains decline more gently to a

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lower series of ranges which in turn soon give way to the sharply contrasting flat and featureless prospects of the Black Sea steppe which constitutes the remainder of the Crimea. In many places the slopes of the Crimean Mountains are covered with forests that would afford good opportunities for concealment. Forest cover is not available elsewhere in the Crimea.

The mountains of the southern coast are orientated southwest-northeast from Sevastopol' (44°35'N-33°34'E) to a little beyond Feodosiya (45°02'N-35°24'E), a distance of about 100 miles. They are most prominently developed in the southwest, where three parallel ranges reach a maximum width of about 30 miles; toward the northeast the mountains grow narrower and lower and finally disappear altogether beyond Feodosiya. Throughout the greater part of the mountains the terrain is typified by steep valley slopes, deeply dissected terraces, large plateau surfaces, and other stretches of relatively level terrain separated by deep transverse valleys and narrow gorges. The southern slopes, particularly on the main ridge, form high cliffs and abrupt escarpments in many places. Elsewhere there are terraces, gullies and narrow coastal strips. Although the northern slopes are more gentle, they are also extensively dissected in places.

Opportunities for concealment are best in the southwestern sector of the mountains. Here there is a rectangular-shaped area approximately 40 miles long by 20 miles wide in which the density of forest cover frequently exceeds 40 per cent. The area is roughly defined by the highway from Sevastopol' to Simferopol' (44°58'N-34°05'E) on the north, on the east by the highway from Simferopol' to Alushta (44°11'N-34°25'E), and on the south and west by the Black Sea. Contained in the area are the highest elevations of the Crimean Mountains and consequently some of the most rugged terrain. The Yaila "flats" assume some of their most characteristic features here at a distance of only about five miles from the Black Sea shoreline in the vicinity of Yalta. The forests do not offer continuous and unbroken concealment throughout this southwestern area, but are interrupted here and there, as on the summit of the Yaila, by patches of open terrain which are sometimes quite broad. The possibility of moving undetected from one

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point to another in this area, however, is good. Slopes are thickly wooded and mountain defiles as well as broader valleys have a screen of trees. Broadleaves predominate, but year-around concealment is available in evergreen stands at higher elevations, particularly on the southern slopes of the Yaila. Undergrowth is not particularly dense, but scrubby growth is common near the summits. The area is completely encircled by all-weather roads and several of this type make their way across the mountain ranges to the southern coast. Approaches to passes are frequently steep and winding. Other roads of an inferior type will also be encountered in this area, but travel on them is subject to the vagaries of climate and season. Resort towns and small fishing settlements are numerous on the southern coast and a number of small settlements are scattered at the lower elevations along mountain valleys, particularly in the western part of the area. Tourist trails will be encountered throughout the area.

Forest cover throughout the remainder of the Crimean Mountains is less extensive, and the mountains are lower and narrower than in the southwest. However, a forested area of about 600 square miles is to be found in the northeast, and there is much rugged and precipitous terrain. Forest cover does not approach closely to the coast and is more fragmented in the mountains. It is possible, however, to move from one part of the area to another with benefit of forest cover, and contact is easily made with the forests of the southwest. Coastal and mountain valley settlements are less numerous, but the network of seasonal roads is quite dense. There are fewer all-weather roads.

The nature of the terrain in the Crimean Mountains poses great difficulties to movement on foot. The sea-facing slopes of the southernmost range present the most serious and extensive obstacle because of the many precipices and high escarpments occurring there. The southern slopes of the lesser ranges are also frequently precipitous. Movement is much more easily accomplished along the line of the summits and on the northern slopes. Local obstacles, in the form of gorges, deep and narrow valleys,

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and rough surfaces, are encountered everywhere, but can generally be circumvented. In the winter, deep snows sometime block passes and greatly restrict or even prevent movement on foot. Mountain streams can be hazardous in spring when swollen by melting snows. As in the Carpathian Mountains, mountaineering experience would be invaluable in the Crimean Mountains.

Settlement patterns vary in the area from place to place. Densest populations are to be found along the southern coast where numerous rest homes and recreation areas are scattered on the wooded slopes. Along the valleys extending into the mountains are gardens, vineyards, and tobacco plantations. The villages whose inhabitants cultivate the fields are closely spaced and thickly settled. At higher elevations, population becomes sparse except in mountain basins and on the most gentle slopes where orchards and gardens are cultivated. Villages are small and generally isolated from one another. Near the summits of the mountains only occasional shepherds' cottages are to be found, many of which were formerly used by Tatar herdsmen and may now be deserted. On the northern slopes of the mountains a second belt of relatively dense settlement occupies lower elevations. In addition to gardens, vineyards, and tobacco plantations, there are grain fields which extend northward into the steppes. These are relatively sparsely populated.

Nowhere are the Crimean Mountains as isolated as other mountainous districts of the Soviet Union. Many paved, all-weather roads cross the mountains and are supplemented by secondary roads and by numerous tourist trails and livestock tracks. Security forces and ground forces of the Soviet Army also are present in the area, particularly at Simferopol' and at Feodosiya.

## 2. Populations and Resistance Factors.

The predominant populations in Area 5 are Russian and Ukrainian. The Russian are concentrated most heavily along the southern coast, on the southern slopes of the Crimean Mountains, and in the cities of Sevastopol' and Simferopol', including their outlying areas. In these sections Russians comprise more than 80 per cent of the population. The Russians are largely an urban group, although a number of Russian farmers have been brought to collectives in the mountain

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valleys and in the steppes to the north. Largely due to the fact that the southern slopes of the Crimean Mountains overlooking the Black Sea are one of the principal tourist centers of the Soviet Union, their populations are undoubtedly loyal to the regime.

Ukrainians nowhere form a majority of the population, although they occupy numerous settlements in the steppes to the north of the Crimean Mountains. Most of them have exhibited no opposition in the past to Soviet rule, although some of the recent settlers are repatriates from Poland and may hold some nationalist convictions. A few Tatars may have escaped deportation after World War II and may be found in the remote, more densely wooded parts of the mountains and could be useful to Special Forces.

During World War II partisan groups were active in the area. The predominant group consisted of Russian partisans who controlled the more remote mountain districts of the Crimea during the entire German occupation. The partisans were not necessarily recruited locally, but were apparently supplied at least in part by the local population. In opposition to the Russians were the Tatars, who also inhabited the mountain districts as well as the plains to the north, and who strongly supported the Germans. Although they destroyed numerous Russian troops and settlers, the Tatars were never able to challenge Russian control of the mountains.

## 3. Economic Vulnerabilities

The only important urban center in the Area is Sevastopol'. It is the headquarters of the Black Sea Fleet, with extensive supply depots and the largest naval ship-repair facilities in the Black Sea area. The Sevastopol' shipyards are also capable of constructing naval vessels including submarines, torpedo boats, and destroyers. Some fishing vessels and other small commercial boats are also constructed here. The small port of Balaklava also has some shipbuilding facilities and serves as an auxiliary naval base. Sevastopol' also has a small electro-technical industry, manufacturing switchboards and munition plants. The other towns in this

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Special Forces Area excepting Simferopol' are all fairly small and most of them are located around the coastline. They are either resort centers or small agricultural centers. Their only industries are food processing and production of consumer goods for local consumption.

There are two railroads in the Crimea which cross each other at Dzhankoy (4542N-3424E) north of Special Forces Area 5. One of these railroads, terminating at Sevastopol', goes northward to the Dnieper Bend Area, Kharkov and Moscow. It is by far the most important of the two in terms of providing the Crimea with the naval supplies for the Fleet and with the wide range of manufactured goods not locally available, and also for shipping the fish and sub-tropical agricultural products of the Crimea to the main urban centers. The second rail line originates at Kerch' (4523N-3626E) and proceeds along the southern and western shores of the Sea of Azov through Perekop Strait to Kherson (4640N-3235E), where it connects with rail lines servicing the central and western portions of the Ukraine. This rail line could be used for land shipments of Kerch' iron ore to the East European satellites (if land shipments are currently being made) and may also be used for obtaining some supplies, particularly lumber, from the wooded areas of Belorussia and the Carpathian Mountains. Most of the rail traffic between Kerch' and the rest of Russia follows this line only as far as the junction at Dzhankoy and then goes north via the Sevastopol'-Kharkov-Moscow route. Both of these rail lines are single-tracked and steam-operated. Fuel is mainly coal from the Donbass although some diesel locomotives are used. The physical vulnerabilities of the sector of the Kerch' line is low inasmuch as it passes through a dry and level coastal plain. The rail line to Sevastopol', on the other hand, cuts through the northwestern portion of the Crimean Mountains, encountering numerous fairly steep grades and passing through a number of cuts at which the right-of-way is vulnerable to interdiction. There are quite a few bridges on this mountain sector, including two long ones, and reportedly six tunnels on the approaches to Sevastopol', four of which have been located on the accompanying map.

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The peninsular nature of this Special Forces Area greatly reduces the vulnerability of rail transportation. Most of the mineral products of the Kerch' Peninsula go north by way of the Azov Sea to Zhdanov (4705N-3736E). Much of the agricultural produce of this area and also most of the fish catch go by water to various ports along the Black Sea and along the northern shores of the Sea of Azov. The bulk of the freight received by the Crimea is also believed to come by sea, including coal from the Donbass and oil from the Caucasus. Because of the limited industrial importance of the Crimea the volume of freight required for the proper functioning of its economy can readily be moved by sea if circumstances warrant.

The Crimea has a well-developed highway network, largely geared to the needs of the resort centers. In addition to the principal paved highway which runs from Yalta (4430N-3410E) to Moscow in this area largely paralleling the railroad north of Simferopol', good highways skirt the coast from Sevastopol' through Yalta past Feodosiya and connect Simferopol' to Yevpatoriya (4512N-3324E) and the northwestern coast of the Crimean Peninsula. A second highway link between Sevastopol' and Feodosiya runs to the north of the main mountain mass through Simferopol'. These highways and the fairly well-developed network of secondary roads serve mainly to collect the limited agricultural products of this region. Highways cannot be considered to be strategic targets from a economic standpoint partly because of the limited economic contribution which the areas served by these roads make to the Soviet economy and partly because the agricultural produce of this region is raised so close to the sea that it could be loaded aboard ships without reliance on the highway network. The only value which highways in this Special Forces Area might have would be military and them only in case of military operations in the Crimea proper.

The main center of power generation in this area is Sevastopol'. The Inkerman power plant which is located at the eastern end of North Bay provides power for Sevastopol' and an extensive area in the southern part of

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the Crimea. Its capacity is reported by most sources to be about 24,000 kw., although one source states that it is at least 50,000 kw. The plant burns coal which is presumably shipped by water from the Donbass. An oil-burning plant of 9,000-10,000 kw. capacity is located on the south shore of North Bay. (All principal sources are in agreement on the identity and approximate size of these two plants; however, one source mentions a third power plant of 12,000 kw. capacity which is a hydroelectric plant located somewhere in the vicinity of Sevastopol'.<sup>1</sup> Another source, which does not list power plants, reports a total generating capacity of 106,000 kw. for Sevastopol'.<sup>2</sup> A number of other power plants are undoubtedly in operation in various industrial concerns in Sevastopol' including one at the main naval shipyard. They are all believed to be small and their joint capacity is certainly not sufficient to explain the large gap in estimates of total capacity between the 33,000 kw. given by most sources and 106,000 kw.) The only other power plant in this area known to be larger than 5,000 kw. is located at Yevpatoriya. The old Simferopol' power plant has only 3,000 kw. capacity, but another power plant, reportedly much larger, is under construction. A reservoir covering an area estimated at 1 km. by 2 km. and backed up by a dam 400 meters long is located two kilometers south of Simferopol', on the road to Alushta. Its functions are unknown. Also under construction is a reservoir near Yalta which will contain the waters of a small river flowing into the Black Sea. It is probable that a hydroelectric power plant is being constructed at the reservoir but its capacity cannot be very large because of the limited water flow and its highly seasonal nature. The oil-burning power plant at Feodosiya may possibly be as large as 5,000 kw. It consists of diesel generators and a power train located just west of the railroad station. Other plants are in operation at the torpedo test station and in the harbor area. A 110-kv. network is centered on the two power plants of Sevastopol', with one line going north to Yevpatoriya, the second northeast to Simferopol', and a third around the coast to Yalta. A 110-kv. line runs between Simferopol' and Yalta, but no information on construction is available.

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Other power transmission lines in this area are 35-kv. At present current flows from Sevastopol' to the various other cities in the high-tension network and the interdiction of the three 110-kv. lines would deprive much of this area of its power. The consequences, however, would not be serious because of the lack of significant production or of large urban populations outside of Sevastopol'. Although there are reports that with the completion of the Kakhovka power plant on the Lower Dnieper the Crimean power network will be connected with the Dnieper-Donbass network by a 110-kv. line, there are no reports of sufficiently large industrial expansion outside of the Kerch' Peninsula which would require considerable increments in power supply. Nearly all the small power plants in the Crimea, with the exception of the sizeable plant at Sevastopol', use oil as fuel and probably depend mainly on water transportation for their fuel supplies. Since the oilfields of the Kerch' Peninsula have no local refining facilities it seems likely that fuel comes from the Caucasus or from the Odessa refining plants.

The only significant mineral production in this area are the salts of the Lake Saks'koye (4507N-3336E). In pre-war years 75,000 tons of sodium chloride were obtained yearly by solar evaporation. Lake Saks'koye also provides magnesium salts, its pre-war capacity being 1,250 tons of magnesium chloride and 66 tons of magnesia. It was the main source of raw materials for the production of metallic magnesium at Zaporozh'ye, which had an output of 400 tons in 1937. Its present importance as a source of magnesium salts is unknown. The salt works near the lake are also reported to extract bromine and possibly iodine from Saks'koye brines. Lake Sasyk (4512-3331) and other nearby lakes also contain large supplies but are not known to be exploited. There are ample supplies both of sodium chloride and magnesium salts in the parts of the Crimea lying outside this Special Forces Area. The USSR has many other larger deposits of salt, so that deprivation of the Saks'koye supply, which although railroad-connected is mainly shipped out by sea, would have little effect on the economy of the Ukraine or of the USSR.

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Because of the peripheral location of Area 5 and its limited economic importance, the telecommunications network is not a particularly valuable target. The main line from Moscow follows the railroad and terminates at Sevastopol'. The main center for wire communications is the capital, Simferopol'. The most powerful radio communications stations are at Simferopol' and Sevastopol', with other stations at Feodosiya, Yevpatoriya, Yalta, and Sevastopol' Turgoyi Port (4436N-3333E). A powerful broadcasting station is located at Simferopol'. Maritime communications include Yevpatoriya, Yalta, Feodosiya, Arabat (4518N-3532), and Sevastopol'. Perhaps of greater interest to Special Forces than the radio or telegraph network is the chain of radar stations skirting the coast of the Crimea. Presumably these radar stations stretch all the way from the eastern tip of the Kerch' Peninsula to the western tip of the Crimea and include early-warning radar stations as well as aerial navigation and maritime navigational control stations.

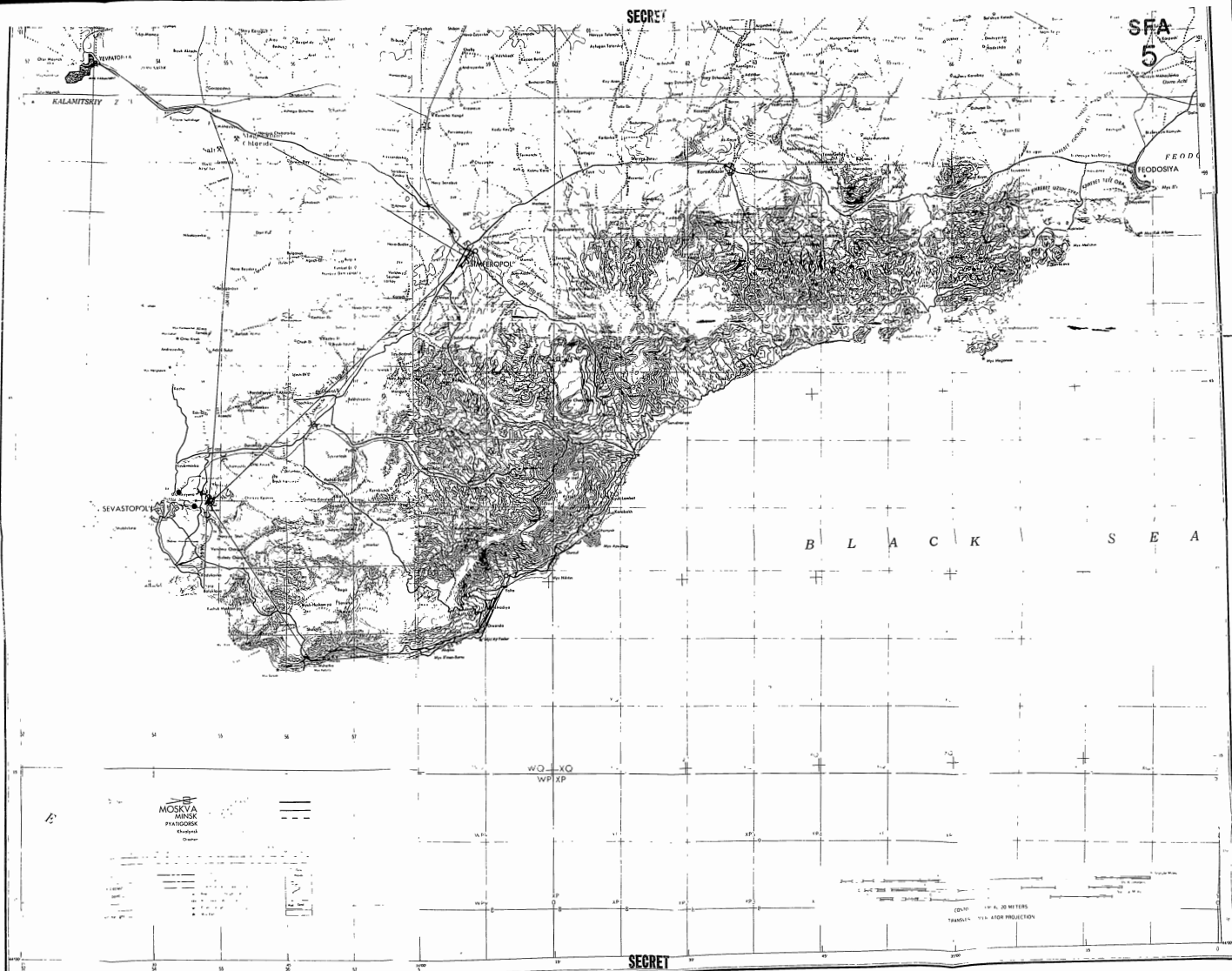
Nearly all the significant targets in this area, with the exception of the rail lines, are along the seacoast or very close to it. The feasibility of seaborne attack should be considered.

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## SPECIAL FORCES AREAS (S)

## LEGEND

( )	Rail bridges
X	Highway bridges
- - -	Tunnel
>	Steep grade
Electric Power Plants	
Hydroelectric	
■	5,000 - 10,000
■	10,000 - 50,000
■	over 50,000
□	under construction
Thermal	
●	5,000 - 10,000
●	10,000 - 50,000
●	over 50,000
○	under construction
▲	Transformer station
Power Transmission Lines	
— 60 KV —	Existing
- - - 60 KV - - -	Under construction
Pipelines	
— ● — ● — ● —	Existing
— ● — ● — ● —	Under construction
⚡	Mines
▲	Oil and/or gas field



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Excluded Areas

Several marginal areas have been excluded as unsuitable for extended Special Forces operations, although they have some concealment which might be adequate for short periods. Some of these areas have features other than concealment possibilities which are favorable to Special Forces operations. One of the areas excluded, although in some respects it is favorable, is an area with Kharkov at its northwestern corner and extending south almost to the Donbass and east to the Upper Donets River. It offers extremely important target systems, particularly the rail lines from the Donbass through Kharkov to Moscow which carry a substantial proportion of the freight from the Donbass north and are essential in supplying raw materials for the very important engineering industry of Kharkov. Also in this area are the newly developed Shebelinka natural gas deposits and the large-diameter pipeline conveying gas to Kharkov. Eventually this pipe line will be extended, possibly as far as Moscow, and its value will be accordingly enhanced.

Another area extremely important from an economic standpoint extends east and north from Dnepropetrovsk. In this area are the main railroad connections between the Donbass and its sources of iron ore and manganese, between the metallurgical industry of the Dnieper Bend and its sources of coal and pig iron and steel in the Donbass, and also the main connections between the eastern and western Ukraine. The Dnieper River itself, of considerable importance for navigation, power generation and irrigation, is a significant target at vulnerable structures. Finally, some of the high-tension lines passing through the Dnepropetrovsk area and supplying it at present with current from the south at Zaporozh'ye and eventually from the northwest at Kremenchug are vital to the heavy industry in this region.

Three other areas in the Ukraine also offer some opportunity for concealment but not of sufficient density to justify their selection as Special Forces Areas. These remaining three regions, although not entirely lacking in target systems of interest to Special Forces, do not have anywhere near the economic significance of the Kharkov and Dnepropetrovsk



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regions. One of these lies east of Chernigov and extends from the Desna River north to the border of the Ukraine. This area has no large cities or important industries. The railroads passing through are important for connecting Kiev and Moscow but of only secondary purpose to other inter-regional trade. A water connection between the Dnieper and the Volga Rivers follows the Desna River in this area but the present level of its utilization is low. A second region of marginal cover and only moderate interest from the target standpoint is located on the Middle Dnieper around Cherkassy. The most significant target system here is the rail line from Kiev to the Dnieper Bend and the Donbass. This rail line, however, can be by-passed both to the south and to the north. The third area is located north of the Dnestr River and is bordered on the west by Areas 1 and 2. It is an exclusively agricultural region with only local industry and no significant mineral production. The main rail lines between the Ukraine and the East European satellites pass further north, although some rail connections with the Moldavian SSR and Rumania lie within this region.

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APPENDIX  
RESISTANCE ACTIVITIES

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FOOTNOTES

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