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# USSR Report

MILITARY AFFAIRS

No. 1799

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ARMED FORCES

UZBEK YOUTH TAUGHT RUSSIAN FOR MILITARY SERVICE

UzSSR Minister Comments

Tashkent OQITUVCHILAR GAZETASI in Uzbek 18 May 83 p 1

[Article by S. Shermuhamedor: "The Russian Language and Patriotic-Military Upbringing"]

[Excerpts]

Everyone knows that a person is not born a soldier. His pride in being a soldier is perfected under the influence of school, family, the Pioneers, Komsomol and military organizations. It is self apparent that one of the most important factors in a firm preparation of youth for service in the Soviet Armed Forces is a fluent knowledge of the language of cross-national communication. Candidate member of the CPSU Central Committee Politburo and First Secretary of the Uzbekistan Communist Party Sh. R. Rashidov has pointed this out several times in his works "Language of Friendship and Fraternity" and "Language of Friendship, Fraternity and Cooperation," as well as in numerous articles and speeches. This question was at the center of attention at the 1975 and 1979 All Union Scientific-Practical Conferences held in Tashkent. . . .

Our general education school is multinational. This is demonstrated by the fact that instruction in our schools is conducted in two, three or even four languages. The boy pupils are consistently being prepared for service in the Armed Forces. This includes primary military preparation, the holding of the militarized "Zarnitsa" and Orlyonok" exercises, trips to places of labor, revolutionary and military fame, lessons of heroism, watches at monuments and many other measures. Still at their class desks pupils become physically tempered and learn to overcome any kind of difficulty in any place; they always keep in mind the words of the great general "if it is difficult during exercises, it will be easy in battle," and they attempt to practice this. Although when every youth begins to go through his service obligation he is prepared to a certain extent, at first it is difficult for him. If he does not know Russian well, if he has learned it poorly, it is even harder for him. Therefore, the Russian language teacher must achieve [a situation in which] his pupils know the Russian language perfectly, so there will be no language barrier among fighting men of various nationalities. For a firm grasp of Russian

provides order both in (staff) exercises and in battle. The Russian word at all times, in all places and in all conditions, including in the army conditions, makes young people's military service easier and provides the opportunity for the young fighting men to become accustomed more rapidly to an unusual environment.

The work carried out in our national school in this area is worthy of attention, and it is directed toward a clear goal.

The practical cooperation of schools with military commissariats in preparing youths for service in the ranks of the Soviet Army is of great importance. It is possible to resolve the problems connected with preparing the future fighting man only with cooperation of the two sides. Here the experience accumulated by those in Dzhizak is exemplary. In particular the Dzhizak city military commissariat, in cooperation with the city department of people's education, has organized 1-3 and even 6 month courses for perfecting Russian language knowledge of those drafted into military service, for their firmly acquiring the most frequently used terms in military service, spoken and reading skills. The language exercises of those attending are primarily in an oral format. As practice has demonstrated, it is appropriate to give instruction on how to write papers, written matters, biographies, statements, receipts, reports and other such documents.

Besides such short courses, circles with lessons according to a special program have been started in the national general education schools. Such lessons are conducted by Russian language teachers, with the close cooperation of military training leaders. The goal of such circles' lessons is to raise the interest among youths in assimilating military vocabulary of the military and the contents of works with military-patriotic themes. The operation of such lessons is varied. It includes discussion, lecture-discussion, vocabulary exercises on understanding military terms, independent work on words, retelling of texts which have been read, reports on various topics, dialogues and others. Teachers give particular attention to selection of instructional materials, mostly text materials and excerpts of works from belles-lettres and memoirs devoted to military topics.

The city military commissariat shows films approximately twice a month on patriotic-military topics for 9th and 10th graders, and then conducts a discussion about the films. Pupils of upper grades exchange ideas in such discussions in Russian.

All of these measures are having a positive influence on the firm acquisition of the Russian language by draft age young men. Especially great is the role of practical field exercises conducted with pupils on military unit bases. In the course of such exercises youths who have a weak command of Russian realize once again the importance of the Russian language for military service, and they begin diligently to study Russian.

We are giving special attention to questions of selecting cadre for military education institutions. Officers of the military commissariat are being assigned to several schools. They, in cooperation with the schools' military

training leaders, work on selecting nominees for entrance into military education institutions and conduct individual work with the nominees. It is noteworthy that in Dzhizak Oblast 70-80% of the nominees sent with orders to military education institutions pass the entrance exams and are accepted into the ranks of students....

But we cannot close our eyes to the existence of shortcomings in the field of preparation for military service. What do these shortcomings consist of?

First of all, the instructional-material base for primary military preparation and civil defense is weak. In a number of instances military leaders limit themselves to conducting theoretical lessons in the classes. On top of that some military leaders themselves do not have sufficient methodological preparation.

### Teaching Russian for Military Service

[Editorial Report] Tashkent SOVET OZBEKISTONI in Uzbek 19 May 1983 carries on page 2 a 1,100-word article by S. Shermuhamedov, UzSSR Minister of Education, titled "Powerful Weapon." The article appears in connection with a republic conference on "The Development of Russian language teaching in republican educational institutions and the improvement of this work among youths to be called up into the Soviet Army," held on May 20-21 in Samarkand. Shermuhamedov stresses the importance of youth knowing Russian in the armed forces, where it is the language of communication between nationalities and is essential to firmly grasping modern military equipment and to enhancing military and political training. In recent years a great deal has been done in the field of Russian language teaching. Today, 15 percent of the total budget of public education schools is allocated for teaching Russian in 1-10th grades. Tests designed to identify levels of knowledge and thus enable movement of students from class to class are being introduced. A variety of contests, clubs, conferences, gatherings, and study circles have been organized on a broad scale. The cooperation of military commissariats has assumed great importance in preparing youths for the armed services. For example, the Dzhizak City Military Commissariat has formed 1 to 6 month courses aimed at improving the Russian of such youths. Also, representatives of military commissariats go to various schools and work individually with students to select candidates for military schools. It is noteworthy that 70-80 percent of the candidates so selected in Dzhizak Oblast pass entrance tests for oblast military schools.

However, it is no secret that there are shortcomings in the field of preparing youths for military service. The level of instruction in classes on elementary military training is generally poor, and rarely includes methodological and practical training. In particular, instruction in elementary military training in national schools must be conducted only in Russian. Assistance must be provided to youths who wish to enter military schools by helping them prepare for competitive exams in Russian. The ties of elementary military training with other school subjects must be expanded. Shermuhamedov concludes that these and other problems, which are to be discussed at the Samarkand conference, are of greatest importance in view of the current complex international situation.

ARMED FORCES

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PHYSIOLOGICAL EFFECTS OF MI-4 HELICOPTER VIBRATIONS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 11, Nov 82  
pp 53-55

[Article by Yu.N. Kamenskiy, Institute of Civil Aviation, Moscow: "Physiological-Hygienic Assessment of Vibrations in the Crew's Cabin on the Mi-4 Helicopter"]

[Text] Helicopter pilots are affected by a large group of factors, vibrations and noise being the most important. Noise and vibrations produce fatigue in the operator, which reduces his reliability as an element in the man-machine system. Vibrations are the leading fatigue factor in this group (K.K. Ioseliani). Only isolated studies have been made of this phenomenon, however, and the vibration characteristics have not been fully defined (N.N. Gurovskiy; O.A. Dzhaliashvili and coauthors).

The task of our project was to study vibrations in the crew cabin of the Mi-4 helicopter and their effect upon the functional state of the pilots in the performance of their usual working flights within the dynamics of a flight shift.

The following methods were used. Vibrations and noise were measured in fixed horizontal flight by means of the RFT vibration and acoustical measuring equipment produced in the GDR. Vibrations were measured from the copilot's seat within octaval frequency bands between 4 and 250 hertz. Four series-produced helicopters were studied in the performance of 54 flights.

The psychological and physiological studies were carried out in two stages. The first consisted of studies performed in flight. The second stage was performed on the ground, before and after the flights, taking the flight load (time in the air) into account. The base data were registered 60-90 minutes before the flights began, the post-flight data 40-60 minutes after the flights ended (Ye.A. Derevyanko). In the air the pilots were studied immediately after they began the horizontal phase (3 minutes after takeoff) and then every 15 minutes during the flight. A total of 57 pilots were studied in this manner. A total of 140 pilots were studied prior to and following the flights, who were divided up into seven groups (20 pilots in each) based on a flight time of 1 to 7 hours in a day. Each was homogeneous with respect to age and position.

We selected the methods for the pilot study on the basis of the "ergonomic" principle for evaluating hygienic factors (Yu.N. Kamenskiy; I.A. Goncharov).

For this purpose, both before and following the flights, we employed professionally significant methods depicting the state of the sensorimotor functional system: critical flicker frequency (KChSM), motion coordination precision (TKD), precision of muscular effort reproduction (VMU) and reaction to a moving object (RDO). For evaluating vegetative functions we used the maximum lung ventilation (MVL), pneumotometry (PTM) readings, pulse rate (ChP), systolic and diastolic arterial pressure ( $AD_s$  and  $AD_d$ ). The data on reaction to a moving object were evaluated by the ratio of the number of premature reactions to the number of belated reactions, which we conditionally called the "indicator of nervous processes" (PNP). The results were worked out statistically with the condition of 95 percent reliability of differences between the mean figures.

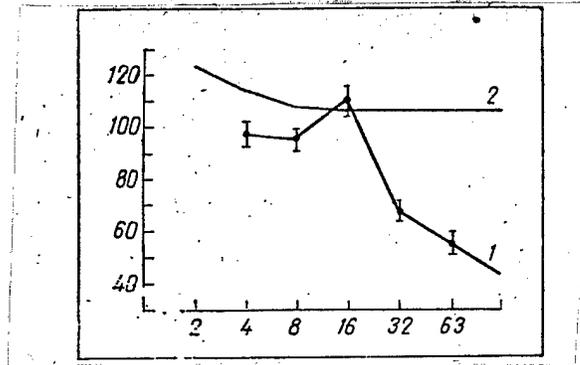
The results were the following. The noise level in the crew cabins ranged from 98 to 104 decibels, averaging  $101 \pm 3$  decibels. The vibration spectrum in the pilot's seat ranged from 2 to 125 hertz, but the highest vibration rates occurred within a narrow range with maximum energy (up to 114 decibels) at an octave of 16 hertz, which is the octave defining the practical spectrum of vibrations for this helicopter (see figure). This spectrum results from the fact that the rotor blades are the main source of vibrations in the helicopter: the basic frequency is determined by the number of blades and the rotation speed of the rotor (A.I. Gudkov and P.S. Leshakov). This makes the helicopter vibrations similar to a semi-harmonic oscillation. The average vibration rate in the octave of 16 hertz was  $110 \pm 6$  decibels. The vibrations and noise affected the pilots intermittently throughout the flight shift: The average for one period of effect was 1.2 hours, that of one interval 0.6 hour.

A specific pattern of psychophysiological shifts was noted during the flights. At the beginning of a flight reaction time was reduced, for example, while it increased at the end by 7.3 percent ( $R < 0.05$ ). The pulse rate increased significantly at the very beginning and remained high until the end of the flight;  $AD_s$  and  $AD_d$  increased at the beginning of a flight and then dropped to a level below the initial level by 5.4 percent and 8.3 percent respectively; the respiration rate and air intake per minute reliably increased in the beginning and then decreased somewhat, but not below the initial rates. The reaction time dynamics indicated a working-in state of the organism at the beginning of a flight and a lowering of its functional level at the end, probably due to pilot fatigue. Noise and vibrations played a certain role along with emotional stress in the development of pilot fatigue. Otherwise it would be difficult to explain the development of fatigue after only 1-1.2 hours of flight. The changes described can apparently build up during a flight shift and result in marked pilot fatigue.

Individual changes in the psychophysiological indices following the flights for the different pilots with identical flying time basically indicated the same trend. The indicators either improved or did not change with a flying time of 1-2 hours. The number of negative shifts increased after a flying time of 3-5 hours and were predominant after a flying time of 6 hours.

Quantitatively, the changes conformed to the trend in the frequency of shifts. After a flying time of 1 hour the critical flicker frequency increased by 3.9 percent, the pulse rate by 4.3 percent, systolic arterial pressure by 5.9 percent and arterial pressure by 11.1 percent. Other indices remained practically

the same. The first indication of fatigue in the pilots came after they had flown 3-4 hours: the critical flicker frequency decreased by 0.8 percent, the accuracy of muscular effort reproduction dropped to the initial level, the accuracy of motion coordination dropped by 11.9 percent, the pneumotometric indices fell by 7.2 percent, and the indicator of nervous processes grew by 33 percent. Changes in the latter involved an increase in the number of premature reactions, which was typical for the initial pilot fatigue (G.L. Komendantov and K.A. Pimenova).



Spectrum of Vibration Rates in Crew Cabin of Mi-4 Helicopter

Level of vibration rates (in decibels), the ordinate; Octaval ranges (hertz), abscissa; 1. Vibration rate spectrum in cabin; 2. Maximum spectrum set by GOST 12.1.012-78; Confidence interval, vertical lines

The indices deteriorated most significantly after a flying time of 6 hours: the critical flicker frequency, accuracy of muscular effort reproduction, precision of motion coordination, indicator of nervous processes, pneumotometric indices and maximum lung ventilation--by 6.2, 60.3, 19, 21, 16 and 12 percent respectively. The marked and coincidental deterioration of all indices indicated considerable pilot fatigue (Ye.F. Polezhayev and V.A. Yepikhin).

Apparently, the pilot fatigue is caused by several factors. Emotional tension on a flight is of definite importance, although this state occurs only for brief periods during takeoff and landing. In horizontal flight the pilots are in a state of so-called operational rest. Noise plays a certain role with respect to pilot fatigue, but the role is much smaller than that of vibrations (K.K. Ioseliani and Yu.N. Kamenskiy, 1979). Furthermore, the pilots constantly use the AG-2M protective headsets, which provide adequate protection against noise. Nonetheless, while recognizing the dominant role of vibrations in helicopter pilot fatigue, it would be incorrect to deny the influence of an entire group of flight factors, and the psychophysiological shifts produced should therefore be interpreted as the result of the combined effect of surrounding conditions upon the pilots, with vibrations as the dominant factor. This was also demonstrated in a study performed by L.N. Shkarinov and coauthors.

If we proceed from the premise that fatigue is a natural result of working under specific conditions, we can consider 6 hours to be the maximum exposure to a vibration rate of 110 decibels in the 16 hertz band. Unexpected situations can always arise on a flight, however, and the physiologically based flight time norms should assure that there are no signs of marked fatigue in the pilots at

the end of the workday (D.S. Kuleshev). With this in mind it is better to limit the total length of exposure to vibrations on the part of the pilots of the Mi-4 helicopter to 5 hours in a workday. Based on the requirements contained in GOST 12.1.012-78, we can establish the maximum vibration rate spectrum for an exposure of 5 hours.

The equal energy principle is used for the medical norming of vibrations (I.K. Razumov) and according to this, the exposure to a vibration rate of 110 decibels should be limited to 4 hours. We must take into account, however, the fact that vibrations affect helicopter pilots for an average of 1.2 hours separated by intervals of 0.6 hour. With intervals of this duration the recovery processes occur adequately intensively in the human organism, which results in the slower development of fatigue in the pilots and makes it possible to recommend an exposure of 5 hours for a vibration rate of 110 decibels.

The suppression of helicopter vibrations is an efficient way to prevent pilots from being affected by vibrations. Substantial technical and organizational difficulties stand in the way of this, however, and it will take time to overcome these. The initial means of protection against vibrations could be to limit the amount of time to which the pilots are exposed to the vibrations. This would help them to retain their good efficiency, create the conditions for developing more efficient work and rest schedules and in the final analysis, enhance flight safety.

Conclusions: 1. The vibration spectrum in an Mi-4 helicopter crew compartment covers a frequency band from 2 to 125 hertz with an average vibration rate of 110<sub>16</sub> decibels at a determining frequency of 16 hertz.

2. The effect of vibrations on pilots in flight is accompanied by phased changes in the psychophysiological indices, with signs of fatigue appearing in the pilots after 60-75 minutes of flight. During a flight shift the development of marked fatigue is observed in the pilots after 6 hours of flight work.

3. The vibration rate level for vibrations in the pilot's seat of an Mi-4 helicopter is recommended at 110 decibels with an exposure time of 5 hours.

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## ARMED FORCES

### 'BRAINWASHING' IN MILITARY

Moscow SOVETSKAYA ROSSIYA in Russian 15 Jul 83 p 2

[Article by A. Peshcherin: "'Brainwashing' Under Helmets"]

[Text] The limousine entered the gates of the headquarters of the U. S. Air Force Office of Special Investigations [OSI], Bolling Air Force Base, Washington, D. C. and came to a stop at the entrance. The young looking sergeant driver opened the door of the automobile, and Brigadier General Beyea, Commander of OSI, exited slowly and went up to his office. The general's working day began by looking over matters prepared the day before by his directors. Everything was here: murders committed by military personnel; theft; malicious mischief; profiteering in narcotics; etc. The general involuntarily made a wry face. Among those arrested were many officers, including senior officers. However, it would be an error to take the general's grimace as chagrin or disruption of his emotional equilibrium. On the contrary, behind it he concealed his excitement, akin to that of a hound which has picked up a trail.

In order to uncover these crimes and punish the guilty, a huge and on the whole finely tuned mechanism worked under Beyea, consisting, according to AIR FORCE MAGAZINE, of directorates for investigation of criminal offenses and fraud, as well as technical services and counterintelligence. The Directorate of Criminal Investigations was most active. It was responsible for the majority of criminal cases under investigation concerning crimes committed by U. S. Air Force personnel both on U. S. territory itself and beyond its borders. Second in importance was the Directorate for Fraud Investigations, which investigated cases of document falsification and forgeries committed to obtain money for incomplete work and contracts, and exposed crimes related to computers, etc. Mostly the clients of this directorate were civilians pursuing various contrivances to obtain their share from the revenues of the Pentagon. The Director of Special Techniques supported OSI with special equipment necessary to organize secret surveillance of suspects with still and movie cameras, night vision apparatuses, and electronic listening devices. The Director of Counterintelligence Investigations was responsible for the security of Air Force bases abroad. His personnel frequently followed government officials, especially of those states which doubted the advisability of further stationing of U. S. aircraft and military personnel in their countries. In order to "sow doubt" in the waverers, a highly placed counterintelligence officer exploited various methods, including having at his disposal special sabotage elements.

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General Beyea pressed his buzzer, summoned his adjutant, and gave him a batch of signed cases. Then he settled back in his arm chair and closed his eyes. All these murders, cases of fraud, and requests for strengthening base security were nothing compared to that which periodically came to his desk under the stamp TOP SECRET. Beyea considered much more serious than murders the fact that a sergeant in one of the military units doubted whether the Russians had really passed the U. S. in the military area. Or a major, previously in good standing, who, having drunk too much whiskey in a bar, babbled that the Pentagon was carrying out a policy not in the national interests of the United States. "And military personnel who have voluntarily entered service in the Air Force permit themselves this," the general thought. "Perhaps the OSI failed to foresee something, and was inattentive in keeping watch over its wards? Hardly." Beyea knew that "sedition" has long penetrated the U. S Armed Forces. He involuntarily gazed at the security container which retained materials about the anti-war sentiments in the Air Force during the period of the Vietnam War, when the government had to stop recruiting volunteers and draft young people into the Army. Many of their number even today actively oppose the growing threat of war.

Beyea shook his head. All this had happened. But the Department of the Air Force no longer tolerates such sentiments among officers and enlisted personnel. Especially now, when the Pentagon is developing new types of military equipment. The main task of the OSI, the general summed up his reflections, is to forge reliable chains, develop an effective apparatus, which would bind the arms and shut the mouths of all these pacifists and "reds" who are penetrating the service or subjecting it to what he considered "corrupting influence." To solve this task the general inserted into various "criminal organizations and groups" his own agents, who revealed their members and plans, and collected documents proving their "criminal activity."

The general straightened his jacket and ordered that the long waiting Director of the Fraud Investigations Directorate be admitted into his office. Having heard his report, Beyea briefly instructed him how to proceed further. He emphasized that it is necessary to redouble efforts and once and for all discourage the small fry from butting in to the Pentagon's pie, which was meant for those who rule the Pentagon and their favorites.

Beyea's old hand asked: "And how should we treat the fact that the NEW YORK TIMES reported on the beginning of investigations into the financial affairs of U. S. Secretary of the Navy Lehman? If the newspaper is to be believed he is accused of using his official position in the interests of the Abingdon Corporation, with which he was associated before being named to his office." He also received large bribes from British firms which intended to come forward in foreign dealings under the mask of the American company.

"Just treat it as a case where one of the bosses might go too far, or at the top of big business they find a more resourceful and promising servant," Beyea replied sharply. "And they try to rid themselves of an old, failed broker, including by the methods which the NEW YORK TIMES reported."

Further, Beyea scheduled a discussion with his assistant concerning OSI cadres. Career non-commissioned officers who have passed special tests and training at a Bolling academy are the primary OSI employees. Three month courses are organized for young people at which the basics of criminology, hand-to-hand combat, and exchanging foreign currency at U. S. Air Force bases abroad are studied. In its turn an institute for U. S. Armed Forces prepares specialists in areas of jurisprudence intended for work as legal consultants in OSI regional offices. In practice they conduct investigations and gather material evidence and clues of crimes.

The assistant reported to the general that the latest graduates entering the OSI had already been assigned, and the young employees had begun work. Of late the OSI has been more and more extensively engaged in exchanging cadres and sending its employees for tours with the CIA and FBI.

Beyea cleared his throat in satisfaction and recommended that his assistant devote more attention to cadre preparation. As the Department of the Air Force believes, and consequently Beyea as well, their training must be provided "by production line," and they should be readied and stored up for when the need for them will increase.

And this is unavoidable, if one has in mind the Pentagon's known plans, and the growing pacifist sentiments in the United States itself.

The OSI is improving its methods of work, although in the opinion of AIR FORCE MAGAZINE it is not distinguished by great originality. Along with normal investigative activities, the OSI is increasingly willing to use agents, informers, undercover personnel, and special equipment, frequently manufactured to its special orders. Computer equipment is widely used in OSI practice. With its help crimes and their methods are classified, identification pictures are compiled, etc. The OSI has its own psychologist who participates in interrogations. During these investigations he uses hypnosis to "stimulate the memory," obtaining admissions of external "participation" and "instigation." The fact that such interrogations contradict existing U. S. law does not bother General Beyea at all. However, the most effective OSI means is considered to be its apparatus of undercover personnel, consisting of people who have joined for these purposes.

The OSI works in close contact with the U. S. Air Force Office of Security Police, which is headed by Brigadier General P. M. Scheidel.

Measures to strengthen control of the frames of mind of Air Force personnel are not isolated or accidental, and correspond to the general policy of the Reagan Administration, which has developed naked psychological warfare and intensified brainwashing of ordinary Americans, especially those serving in the Armed Forces. The LOS ANGELES TIMES confirms this, reporting about increased censorship in the U. S. Department of Defense [DoD]. Under the pretext of a struggle to protect secret information, DoD issued an order, pursuant to which all employees in special military services and elements authorized intelligence information henceforth must sign a "voluntary agreement" not to divulge this information. If they do not do this they are threatened with dismissal.

The Pentagon directive concerning the use of lie detectors to check up on employees of certain special elements should be viewed in the same light. According to information of the INTERNATIONAL HERALD TRIBUNE, it is intended to be used to check up on candidates joining these elements, and also persons suspected of divulging or leaking information. Whereas in the past such checks were voluntary, in the future all must undergo them. According to the paper's calculations, no fewer than three million military personnel and civilians are included in those to be given lie detector examinations. It is also proposed that lie detectors be widely used in investigations of sabotage, attempted mutinies, etc. The paper expresses the opinion that the new directive was developed at the initiative of U. S. Deputy Secretary of Defense Carlucci, who previously occupied a responsible position in the CIA, and is trying to transfer its methods to the U. S. Army. Apparently the laurels which the CIA gained in the field of concealing human rights and violating legality give the Pentagon brass no rest, encouraging them to follow the same path which scandalized U. S. intelligence.

9069

CSO: 9144/0332

ARMED FORCES

INTERVIEW WITH COL GEN TANK TRPS DRAGUNSKIY ON WWII

Moscow SOVETSKAYA ROSSIYA in Russian '29 Jul 83 p 5

[Interview with Twice-Honored HSU Col Gen Tank Trps D. A. Dragunskiy by Anatoliy Khorobrykh: "Do You Remember, Comrade?: From Lake Khasan to Berlin and Prague"; date and place not specified]

[Text] Two banner dates--the 40th anniversary of the Battle of Kursk and the 45th anniversary of fighting at Lake Khasan--coincided these days in the life of my companion. I talked to him about this.

"That's not quite right," smiled the general. "It's not two, but three memorable dates. This year also is the half-century of my Army service."

I looked at the lapel of the general's uniform, where the emblem "50 Years in the CPSU" gleams alongside the gold stars of a Hero and the many rows of medal ribbon bars, but I didn't get my question in.

"I celebrated this jubilee two years ago," said my companion, intercepting my gaze. "I joined the party even before entering the Army."

"When you worked in the Komsomol?"

"Not quite," said the general, again smiling. "I began in Mosstroy [Moscow State Construction-Installation Trust] after an unsuccessful attempt to enter a tekhnikum. At first I dragged a 'goat'--a one-wheeled wheelbarrow with bricks--along the shaky construction scaffolding. Later I became a digger. KOMSOMOL'SKAYA PRAVDA once made flattering remarks about the work of the brigade which I headed. In 1930 I was elected deputy to the rayispolkom from Krasnaya Presnya. It was then that I was accepted as a candidate member of the Bolshevik Party."

"Did you also have occasion to work in the village?"

"Under party mobilization," said my companion, and he pondered, trying to remember or figure something in his mind. "Probably in those days," he began after a minute, "I really understood for the first time and sensed with my whole heart what the words 'it is necessary' meant for a communist. I worked as rural soviet chairman in the village of Akhmatovo, Molokovskiy Rayon, Kalinin Oblast. When I became a party member I was elected secretary of the

party organization which united party members of 16 neighboring villages. I love those places to this day..."

We're chatting in the general's office. For 14 years he has been in charge of the "Field Academy"--the "Vystrel" Higher Officer Courses, which bear the name of Mar SU B. M. Shaposhnikov. He gives lectures, directs tactical exercises and passes on his very abundant life and combat experience to the students. He has something to tell the people.

Tank company commander D. A. Dragunskiy received his baptism of fire in fighting at Lake Khasan. I asked my companion to recall the events of those far-off days.

"We graduates of the Saratov Armor School arrived in the Far East," he says, "on New Year's Eve of 1937. Vladimir Belyakov, Andrey Barabanov, Vyacheslav Vinokurov, I and Pavel Zhmurov were all lieutenants and had been declared outstanding. According to the provisions then existing, and as it is even now, we had the right of choosing our duty station, but we were told: 'It is necessary!' We responded: 'Yes, sir!'."

"Service went successfully. After a year I was entrusted with command of a company. My classmates from school also did not fall on their faces, but I was entrusted to be first to accomplish one curious experiment. Before the eyes of our entire 32d Rifle Division our crew took the tank across a river under water."

"Did this experience come in handy later?"

"And how!" exclaimed the general. "In 1944. True, in a somewhat altered form, but the essence is not a matter of technical details. The key factor is something else--it was not a lone crew but an entire brigade (!) that made an assault crossing of the Sanok River in a similar manner. I tell you that it was an unforgettable spectacle. The river was two meters deep and a tank was 2½ m high. Only the gun and part of the turret peeped out of the water... But we have strayed. Let's return to the events at Lake Khasan."

The general closed his eyes for a second and passed his hand over his face, holding it for an instant on his right cheek.

"I won't talk about the reasons for the conflict or, more accurately, aggression," he began, "they are generally known. I'll share personal impressions so to speak. Before entering battle against the Japanese samurai we had to make a 200 km forced march in 35 degree heat."

"The general assault on the enemy positions began on 6 August. The 3d Company which I commanded was attacking Nameless Hill. It was unbelievably hot in the tank, with nothing to breathe and the shell cases burned the hands. But the people were spoiling for a fight and they knew their combat missions excellently."

"Our tank clambered up the steep slope meter by meter, and the others were not lagging behind, but suddenly something gave a jerk in our machine. Small

fragments pierced my cheeks and nose like needles. I sensed that the tank was going to the left. It was rolling downward irresistibly and soon froze in place after burying itself up to the turret in a marsh.

"I clambered out of the hatch. Driver-mechanic Andrey Surov had been killed and the other crew members had been wounded. But the company was continuing the attack and accomplished the assigned mission with honor. I admit that I was pleased to see this.

"On 11 August our troops concluded the total rout of the invaders. Pavel Zhmurov, Vladimir Belyakov and myself were decorated with the orders of Red Banner and in the spring of 1939 all three of us crossed the threshold of the Frunze Military Academy.

"Intense training began but we did not succeed in completing the course as war broke out.

"'You'll receive diplomas after the victory,' said the Academy chief in parting. 'We will take your successful actions at the front into consideration and will be happy to give you an "outstanding"'. "

Sr Lt D. A. Dragunskiy was appointed tank battalion commander. He rode to the location of the activation along that same route over which party mobilization had led him to work in the village--such coincidences do occur. But how everything had changed in ten years! At that time the first kolkhozes were being organized and the "first Bolshevik spring" had been conducted, but now there were the stern and tragic days and nights of the initial period of the war...

"I didn't have long to fight at the head of a hastily created tank battalion," recalls my companion. "Very soon many crews proved to be 'horseless' and we were forced to fight in dismounted formation, figuratively speaking. Here--this was in the forsts near Smolensk--is where I again sensed to the full extent what the words 'it is necessary' meant. I, who could be said to be a born tankman, was made a combined-arms commander or, more accurately, chief of staff of a rifle division. Even the conferring of the military rank of 'captain' did not reduce my bitterness, but 'it is necessary' means it is necessary."

The fighting in Smolensk Oblast, difficult days of withdrawal, the encirclement, penetration across the front line and losses of combat friends--the newly made chief of staff had to experience everything. The difficulties didn't frighten him. He matured, grew stronger and learned to find the only correct decision and take full responsibility. And suddenly...

"You'll go study in the General Staff Academy," announced the commander. "You earned this right. Yesterday you were promoted to 'major' and recommended for an order a second time. In the rear no one will dare reproach you for anything."

After completion of an accelerated academy course he was an operator and scout, but the dream of returning to the tankmen's combat formation didn't leave him for a moment. Gen M. Ye. Katukov, commander of the 3d Mechanized

Corps, future Twice-Honored HSU and CIC of the 1st Guards Tank Army, understood this better than the rest. It was he who appointed Dragunskiy chief of staff of the 1st Mechanized Brigade.

"In this position," says my companion, "I took part in the fighting in the Kursk Bulge, but I only had occasion to fight five days--I was wounded in the leg. But I wasn't about to stay in bed in the field hospital. That wasn't the time..."

The general was silent a long while. It wasn't easy for him to recall the difficult fighting and old wounds but he gathered strength in recalling that we wouldn't be talking only about the fighting at Lake Khasan and about the Battle of Kursk. I asked him to tell how he became tank brigade commander.

"From familiarity," smiled David Abramovich slyly, "or more precisely, I used cunning. I fled the hospital not to my 1st Guards Army but to the 3d, to Rybalko. And in it I fought until Victory Day commanding the 55th Guards Tank Brigade."

Until Victory Day... Oh, how far off it was to that day! The liberation of Kiev and a raid against the rear areas of Manstein's army, a stubborn engagement on the Teterev River and again a very serious wound, this time in the liver. But it was only the third year of the war. The physicians needed more than a half-year to return the brave tankman to combat formation.

"Do you know what the best medicine was for me in the days of recuperation?" asked the general suddenly and a blissful smile spread on his face. "A note from Gen Rybalko. Almost 40 years have gone by since then but I remember it word for word: 'I ask the favor of ending the war together.' And we ended it together. In the summer of 1944 I again took over my own 55th Guards."

I remind my companion about the unusual assault crossing of the Sanok River.

"It really helped us out then," says the general. "We dashed to the Vistula so quickly that the Hitlerites didn't have time to organize a crossing, while we immediately sent a battalion of submachinegunners across on improvised means..."

The fighting on the Sandomierz Base of Operations lasted 27 days. Col Dragunskiy's tankmen didn't waver once. The brigade was decorated with an order and the Gold Star of a Hero of the Soviet Union shone on the brigade commander's chest. And again into battle, at the head of the Army's forward detachment.

"On 10 February 1945," recalls the veteran, "we took the city of Bunzlau after a brief but resolute attack. It was with a trembling heart I read an inscription in the city center on a three-sided granite obelisk: 'General Kutuzov led the victorious Russian troops to these places, but here death marked the limit of his grand deeds. He saved the homeland and opened the paths for liberating Europe. Blessed be the hero's memory.'"

"When the tanks passed the place where Kutuzov's heart rested we halted the column and held a meeting. The tankmen spoke about the glory of Russian arms

and swore to be worthy of the memory of their heroic forebears. And they kept their word. After a successful conclusion of the battle for Berlin we made a march to help Prague. We learned about Germany's surrender in the northwestern outskirts of this city...

"You want me to tell about the second Gold Star? I was presented with it right after the war. An Ukase came out on 31 May 1945. I took part in the Victory Parade, later commanded a tank division and was deputy commander of a military district. And again the words 'it is necessary' made adjustments in my life. I was assigned chief of the 'Vystrel' Courses. For me this was a radical break with customary active Army practice. Frankly speaking the 'breaking in' under the new conditions was difficult..."

At this time one of the telephones rang. The general lifted the receiver and listened to the party for a long while in silence. When the other had had his say David Abramovich said firmly in a soft voice: "There is such a word 'necessary'." In this phrase he was everything: party member, frontlinesman, pedagogue.

6904

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ARMED FORCES

POOR PREPARATION CAUSES FAILURE OF NIGHT TRAINING EXERCISE

Moscow KRASNAYA ZVEZDA in Russian 2 Aug 83 p 1

[Article by Maj A. Petrov: "Why a Night Attack Failed: The Failure"]

[Text] The infantry fighting vehicles moved from behind the woods at high speed. Only the clearance lights twinkled in the darkness. Deploying into combat formation, the armored wave rolled irresistibly on the "enemy" strongpoint. It seemed the night attack was developing successfully.

But the combat formation of the company commanded by Sr Lt P. Dragomiretskiy suddenly broke. The tank platoon commanded by Sr Lt M. Yermishkin, attached to the subunit, deviated from the designated axis and coordination broke down in other platoons as well. One of them even lost control over movement. Sr Lt V. Kantsiyal and lieutenants V. Yefanov and V. Nikishin, as it was later learned, did not pass the test for independence. They lost control of the subunits. The night attack which concluded a company tactical exercise was disrupted.

A natural question arises: What were the reasons for the subunits' unsuccessful actions? Some company and battalion officers were inclined to consider what happened in the exercise almost as a chance happening. They referred to the fact that the sudden loss of coordination among platoons occurred because of a deep wooded area on which the attackers "stumbled" during the attack. But both company commander Sr Lt Dragomiretskiy and the platoon commanders should have foreseen such a chance happening during night combat. They knew they had to operate on mountainous woodland, and hoping that the commander would have ideal conditions in the night attack for controlling the subunits and fire meant knowingly simplifying the tactical situation and not preparing themselves for surprises on the battlefield.

But the real reasons, as it turned out later, lay elsewhere: Company officers were poorly trained in methods of subunit control at night and had prepared little for a night attack. For example, preparation for combat in the attack position began with an unjustified delay, only after the regimental commander arrived at the range. The motorized riflemen naturally had just enough daylight time and much had to be done: prepare the combat equipment for night actions, perform ground reconnaissance, come up with a light discipline plan and so on. When twilight set in it was discovered suddenly that a fuel pump was faulty in one of the BMP's [infantry fighting vehicles], that tank platoon

commander Sr Lt Yermishkin had no operational map, that the crews had not been informed of specific missions and that some driver-mechanics were not able to use the night vision devices...

And on the whole a seal of haste and incompleteness lay, as they say, on all preparations for the night actions. Sr Lt Dragomiretskiy assigned missions to platoon commanders in the most general terms, without thinking out coordination matters in advance. He was figuring that it would be possible to make necessary clarifications during combat.

It is also impossible to ignore one other serious omission. On the day before they "forgot" to hold a tactical drill problem in the company on the topic to be worked in the exercise. Battalion commander Maj A. Novokshonov tried to arrange such a class right at the range, but naturally nothing came of this.

All these mistakes, which are telling in any situation, were felt with special force during the night attack. It is known that arrangement of coordination on mountainous woodland even in the daylight is fraught with great difficulties, and so especially thorough work is required to coordinate the actions of all forces and weapons under special conditions, at night. Loss of control in night combat even for a short time can foul up the combat formation, which strictly speaking occurred in the exercise.

Another deficiency also was felt with all obviousness: Genuine command training of officers and NCO's had not been arranged in the battalion. While, for example, commanders' drills in subunit control are conducted often during the daytime, this effective form of training hardly was used at all in night problems. The exercise showed that young officers have a poor mastery of communications gear and have not been trained in using light signals. And how could they master, let's say, radios to perfection when as a rule communications equipment was not used in command training classes and radio drills were rare?

The failure of the night attack in the company tactical exercise reaffirmed the truth that where a genuinely scientific organization of the training process is lacking, where there is no fight against indulgences and oversimplifications, failures of classes are inevitable and there is a useless waste of training time. The exercise was an object lesson for subunit commanders, and officers of the regimental staff also have something to ponder, particularly what has to be done to remedy the deficiencies in the personnel's night training.

6904

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AIR FORCES

DEVELOPMENT OF SOVIET AIRCRAFT 1939-1941

Moscow ZNAMYA in Russian No 6, Jun 83 pp 112-143

[A portion of memoirs of Aleksey Ivanovich Shakhurin, people's commissar of the USSR aviation industry on the eve of and during the Great Patriotic War, prepared for publication by Zh. V. Taratuta; "Wings of Victory"]

[Text] An Unexpected Assignment

The appointment as people's commissar of the aviation industry, with which I would like to begin my memoirs, was a total surprise to me. In the first days of January 1940 I received a call from the Central Committee at Gorkiy, where I was working as party obkom secretary. I was asked one question:

"Comrade Shakhurin, can you leave for Moscow today?"

I answered that a session of the oblast soviet of workers' deputies was now underway, that I was chairing it, and that it would last all of today and possibly even tomorrow.

"Then, Comrade Shakhurin," I was told, "explain to the comrades that you are being summoned urgently to the Central Committee. Is there a possibility of leaving immediately?"

"The train leaves in two hours."

"Then come ahead."

Based on the experience of working as an obkom secretary in Yaroslavl and in Gorkiy I knew that if they don't tell you why they are calling it makes no sense to ask. But without having asked the one who phoned me anything, I asked myself: "What can explain this completely unexplained summons? What should I prepare for?" I began to go over in my mind what matters might be causing dissatisfaction and which ones might be of special interest to the Central Committee, but I found no answer. Things were going rather well on the whole and in my view there were no problems which demanded special discussion or resolution.

I phoned home and announced that I was traveling to Moscow urgently. Then I began to pick out the materials which I might need for various kinds of inquiries.

I was in the Central Committee on the morning of 10 January by the beginning of the workday.

"Very good," I was told, "Stay here. If you have some kind of business in the departments, take care of it, but in such a way that we know where you are and can find you at any moment."

Nothing was clear. That meant the matter for which I was being summoned would not be resolved here, or it would be resolved here, but at another time. But then why was the summons so urgent? I dropped in on one department, then another, and chatted with the comrades about various matters, but the thought about why they had called me gave me no rest. That's how almost the entire day went. Finally I was invited in to see the Central Committee secretary at around five o'clock.

"You and I now will drive to the Kremlin to see Comrade Stalin," he said.

The path from Staraya ploshchad' to the Kremlin building where Stalin worked was short, but it is easy to imagine how many thoughts flashed through my head during these short minutes.

The vehicle darted through the gates of the Spasskaya Tower and we drove up to the building we needed. We went up to the second floor and entered the reception room. We already were expected and were led into an office without delay. This was a long room containing a large desk covered with blue felt and with chairs shoved close, and a bit farther away another desk and small table with telephones. Stalin, Molotov, Voroshilov and other Politburo members were in the office. Everyone was sitting except for Stalin, who was pacing around the room.

Stalin asked us to sit down and continued to pace silently for some time. Then he stopped near me and said:

"We want to appoint you people's commissar of the aviation industry. We need fresh people and good organizers who moreover know aviation matters. What do you think about this?"

The proposal was unexpected. I didn't know what to say. I answered that I hardly would cope with this job. Moreover, I had not been in Gorkiy long, it was interesting to work there and there were many plans for the future which I wanted to implement.

Voroshilov intervened in the conversation and remarked with his inherent good nature:

"With the kind of oblast you are managing you will cope here as well."

Molotov asked me to clarify where I had worked previously and took a special interest in the work at the Air Academy. Other questions were asked. At this time Stalin's secretary Poskrebyshev went up to him and reported something. Stalin said:

"Have him come in!"

Poskrebyshev left and returned with a young man in military uniform. Turning to me, Stalin asked:

"Are you acquainted?"

"No," I responded.

"Then get acquainted. This is designer Yakovlev."

He pointed to me:

"And this is the new people's commissar of the aviation industry Comrade Shakhruin."

I realized that the question of my appointment had been decided.

Stalin asked me:

"How old are you?"

"Thirty-five," I answered.

"Well, you see," he remarked to Yakovlev, "what a young people's commissar you have. That's good."

I noticed that with Yakovlev's arrival a jocular tone appeared in Stalin's voice. Before this it seemed to me that I could hear notes of doubt and concern in his voice.

Coming over to me again, Stalin said:

"Comrade Yakovlev will be your deputy for experimental aircraft construction. We'll talk about the other deputies later, but now tell me, whom would you recommend as obkom secretary in Gorkiy in your place?"

I named Mikhail Ivanovich Rodionov, the oblispolkom chairman who before this had worked as obkom third secretary and had worked in the field of agriculture.

"And why would you recommend specifically him?" asked Stalin.

"I know him well."

I described Mikhail Ivanovich. A native Gorkiy resident, a teacher by education who had worked a long while as raykom secretary and knew the people well. He enjoyed their trust and authority. In short, the most suitable person for this work in all respects. And I was not wrong. Mikhail Ivanovich was obkom secretary, and a good secretary, throughout the war and after the war he took over the RSFSR Council of Ministers.

The conversation had come to an end. I asked permission to travel to Gorkiy to turn over my work. Stalin delayed a bit, then said that this hardly could be done:

"The work must be turned over in Moscow. The work awaiting you brooks no delay. We will invite everyone necessary here and we will send a Central Committee representative to Gorkiy to brief the obkom about the decision. You cannot lose a single day or a single hour."

While I was going to the hotel the people in Gorkiy learned about my new appointment. Rodionov left for Moscow.

The next morning began the familiarization with the work of the People's Commissariat of the Aviation Industry. The following procedure was established: Each day we would hear and discuss a briefing by one of the main administration heads in the presence of plant workers and staff workers. Suggestions aimed at improving matters would be made during the discussion. Everyone who wished spoke. In my view that procedure greatly proved its value. It would put one in the picture immediately, help in seeing achievements and weak points, trace the most difficult problems, and permit an assessment of the status of a particular sector with sufficient depth.

In the course of these discussions I realized once and for all why I had not been given a single day of postponement and why the party Central Committee began to take a complete set of steps so decisively and urgently, steps which were to change sharply the status of our aviation industry.

Matters in fact brooked no delay: It was necessary to eliminate the backwardness in aviation technology in short periods of time. The level of the Soviet Armed Forces' technical outfitting reached by the mid-1930's, a level which was high for its time, no longer corresponded to the situation of imminent danger of war and did not satisfy the higher demands which showed up during World War II, which had begun. A special commission set up by the party Central Committee and government inspected the status of the Armed Forces and noted that Soviet aviation equipment "lags in its development behind the aviation of foremost armies of other countries in speed, engine power, armament and strength."

Why and how did this lag occur?

I believe the key factor here was that a certain complacency over what had been achieved appeared at a certain stage. By the end of the 2d Five-Year Plan Soviet aircraft builders had been able to accomplish an extremely difficult task--they created aircraft which were considered the best in that period. Numerous records, records which were really significant and which brought fame to our country and our aviation, were set in these aircraft. They were evidence that we had created a powerful aviation industry and everything that went with it: scientific research institutes, experimental design bureaus and so on. In my view, however, by creating an atmosphere of confidence that our country was ahead of other countries in the aviation field, these records and achievements generated not only a fully justified feeling of pride, but they also acted as a tranquilizer to some extent.

The appearance of new combat aircraft abroad also was not immediately evaluated. Our pilots saw them for the first time in the sky of Spain, but the exceptional proficiency of Soviet volunteer pilots (it was not rank-and-file

pilots who came to Spain, but the flower of our aviation, pilots with outstanding combat training) and their boldness and valor allowed significant victories to be won not only over aircraft of obsolete designs, but also over the new German fighters of the Messerschmitt design, which had not yet been completely finished and to some extent were still "damp." But when the Hitlerites perfected their aircraft toward the end of the war in Spain and they began to surpass the aircraft in which Soviet aces were fighting in their flying, tactical and combat qualities, for some reason no serious attention was given to this right away.

A conference was held in the party Central Committee in February 1939 with the participation of Politburo members, heads of the Air Force and aviation industry, aviation designers and pilots. The conference outlined a concrete program for the development of Soviet aviation and for outfitting it with modern equipment. Primary attention was given to the development of new aircraft models, and fighters above all. A number of very important party Central Committee and USSR Sovnarkom [Council of People's Commissars] decisions followed one after the other about the development of the aviation industry and creation of new combat aviation equipment. A number of these measures also contained changes in the leadership of the People's Commissariat of the Aviation Industry.

After some time my first deputy became Petr Vasil'yevich Dement'yev, who before this was the director of the Moscow Aviation Plant. I had known him for many years from the time I was assigned as Central Committee party organizer at that plant. At that time Dement'yev was deputy chief of a shop. Strong-willed, decisive and with a good grasp, Dement'yev quickly got his bearings in the situation and determined exactly the key factor in it. In that difficult situation in which the aviation industry found itself, when it was necessary not only to test a large number of experimental aircraft in the shortest possible time, but also immediately place the chosen models in series production, the first deputy people's commissar was required to have both a good knowledge of aircraft construction and great firmness and assertiveness so as to bring matters to a conclusion under any circumstances. An exceptional situation also required exceptional energy in accomplishing the extremely difficult and complicated tasks. Being responsible for series production of all types of aircraft, Dement'yev was able to carry out many of the planned major activities which allowed making up for lost time to a considerable extent and even outstripping the deadlines given us by the Central Committee. Later, several years after the war, Petr Vasil'yevich took over the aviation industry and directed it continuously for almost a quarter century.

Pavel Andreyevich Voronin, a person with a high aviation culture and an expert in plant affairs, was appointed deputy people's commissar and chief of the main administration of fighter aviation. He had gone through all levels--from worker, foreman and shop chief to plant director--and had received an engineering education without separation from production. Everything in him generated special sympathy for him, from his external appearance (and he always was dressed with accentuated neatness) to his manner of speaking simply and sincerely. His most important trait was an inner need to act. No matter what the situation, if it was necessary to help the plants Pavel Andreyevich would

fly to the place at any time of day or year. His arrivals at the plants always ended with his suggestions on what to do and how to do it. One sensed that the people working side by side with Voronin received great satisfaction in associating with him. They saw in him an experienced leader who would help without shouts or noise. Pavel Andreyevich did a great deal for series production of fighters. He worked on this before the war and throughout the war.

Aleksandr Ivanovich Kuznetsov, deputy people's commissar and chief of the main administration of bomber aviation, who had worked previously at one of the aviation plants as a military representative and later as a Central Committee party organizer, was just as energetic. At the time he was appointed he was deputy people's commissar for personnel. Aleksandr Ivanovich loved aviation equipment and had a good knowledge of the bombers, the production of which he oversaw. Remaining a main administration chief throughout the war, Kuznetsov contributed much to the improvement of our bomber aviation.

On the day I was appointed, as already mentioned, Aleksandr Sergeyeovich Yakovlev became deputy people's commissar for experimental aircraft construction. He seemed to me to be a strong-willed, purposeful leader and designer who was able to attain the goals set for him. In combining design work with the position of deputy people's commissar, Yakovlev achieved great success in creating combat fighters, which together with fighters designed by S. A. Lavochkin, comprised the basis of Soviet fighter aviation during the past war.

Vasiliy Petrovich Kuznetsov, deputy people's commissar for experimental engine building, was respected not only in the aviation industry, but in the Air Force as well. All his life was linked with military aviation. A great expert of engine matters, Vasiliy Petrovich began at one time as a mechanic, a simple motor mechanic. On becoming a deputy people's commissar he proved to be that very person who could delve into everything and find a solution to something for which at times others had been striving for a long while. Vasiliy Petrovich had surprisingly even relationships with all chief designers in the field of engine building, with workers of the people's commissariat, and at the plants. He was respected everywhere. A sociable person, when the occasion presented itself he loved to tell some story from his life.

The majority of main administration chiefs of the people's commissariat remained at their places. There was no need to replace them. As a rule they evaluated their work self-critically and correctly outlined the immediate and more remote perspectives. The chiefs and chief engineers of main administrations and the chiefs of functional administrations and departments of the people's commissariat comprised that nucleus in management of the aviation industry which the people's commissariat leadership could rely on in solving extremely acute, complicated problems brooking no delay. They were experienced, knowledgeable specialists who always were mentioned with warmth and sincerity. Among them were I. V. Kulikov, V. P. Sovetov, N. Ya. Balakirev, M. A. Lesechko, B. N. Tarasevich, M. N. Stepin, A. D. Shits, V. A. Tikhomirov, G. D. Brusnikin, V. M. Dubov, A. I. Mikhaylov, V. A. Zorin, I. D. Domov, A. A. Shekhtman, D. Ye. Kofman, N. I. Sysoyev and Ya. T. Gavrilenko.

One evening after the first most urgent matters had receded I became acquainted with the Air Force leadership. Their chief at that time was

Yakov Vladimirovich Smushkevich, Twice-Honored Hero of the Soviet Union, who had become famous in fighting in Spain and at the Khalkhin-Gol. Yakov Vladimirovich was in love with aviation, flew many types of aircraft and was able to converse with pilots in their "native" language. Smushkevich had a serious accident in a flight not long before assignment to this post and had injured his legs. He walked by leaning on a cane or crutch.

I had had occasion previously to be in the office of the Air Force chief when I was still working at the Academy. Most of the time these were official meetings. I also expected something similar this time and I must admit that I crossed the threshold of Smushkevich's office with a certain alertness, but what I saw astounded me. First of all the office had a strange appearance: A cot was attached to the desk and nearby was a dining table. As Smushkevich explained to me later, illness at times forced him to work lying down. Just outside the door I heard laughter, which also was unusual. On entering I caught sight of animated faces and smiles. Someone apparently had just cracked a joke and the atmosphere in the Air Force chief's office was quite relaxed. F. A. Agal'tsov, commissar of the Directorate of the Air Force, who was a future marshal of aviation, an outstanding political worker and commander, and other comrades were here.

Resting on a cane, Yakov Vladimirovich hastened toward me although I tried to stop him. He greeted me like an old acquaintance and I immediately realized that one could be extremely open here and immediately get down to business.

My first words were:

"Yakov Vladimirovich, I'm very happy over this meeting. I wish to believe that it will be the beginning of our difficult and very complicated joint work."

Smushkevich immediately responded:

"I have wanted to meet you for a long time."

I told Yakov Vladimirovich that I had finished taking over matters in the people's commissariat and had received a decision on aviation industry tasks and prospects. The tasks were enormous and the deadlines were rigid. Not only new aircraft meeting the demands of modern warfare had to be created, but they also had to be started up in series production quickly. For this it was necessary to test experimental models immediately on which designers and plants now were working and choose from the many types of combat craft those needed by our military pilots.

"So that we ourselves won't be sleeping and we won't let you sleep."

Yakov Vladimirovich cheerfully responded:

"We have waited for this impatiently." He added: "Don't worry, Comrade Shakhurin. The most important thing now is to create those aircraft which would be better than anyone has. We are waiting for such aircraft and we will do everything dependent on us."

I told him what kind of aircraft were being created and who was working on them. Daring projects were being embodied in the combat designs, and within deadlines which the history of aviation had not known. New aircraft which had to be tested and flown would be leaving for the airfields and the ranges for testing in literally 1-2 months. And here is where we were counting on the Air Force, where there were many talented, experienced people whom I had known back in the Air Academy. They could help the industry determine objectively which of the models were most promising and needed by the Red Army.

"Yes," agreed Smushkevich with animation, "we are ready to help with all resources. War already has broken out in Europe. Everything must be done so that we are not caught unawares. As Air Force chief I am ready to give any assistance."

People would enter the office as we were conversing--directorates chiefs, chief engineers and other comrades. Yakov Vladimirovich introduced me to everyone. He was energetic, active and lively. Several times he would go to the telephone, summon the duty officer, issue instructions and call in the adjutant. One sensed that he was very concerned by the new tasks and upcoming changes.

It was not at all noticeable that Smushkevich was being overcome by a serious illness. Had it not been for the cane and the cot next to the desk the thought that the leader of our Air Force was seriously ill never would have entered the mind. In looking at Yakov Vladimirovich, at his face and his movements, seeing his impetuosity and listening to his jokes it was impossible to imagine that this person was seriously suffering.

In recalling this meeting I would like to say that I did not meet a person of such valor, such boldness of judgement and such charm as Smushkevich possessed among the many aviation commanders of high ranks with whom fate brought me together. I also saw him during meetings with Stalin. Yakov Vladimirovich always defended his opinion boldly and persistently. Stalin would listen carefully to particular ideas and often would agree with them. It was these discussions that largely determined the program for expanding aviation production and the correlation among various air arms which played a large role in the Great Patriotic War.

I subsequently met with the Air Force chief many times, but only in the evening or at night in offices, while during the day we would meet in the design bureaus and at the plants and airfields. Nothing was recorded during these meetings, but nevertheless all the extremely important and serious decisions agreed upon invariably were fulfilled.

#### What Happened Before This

On approaching Moscow by rail from the direction of Kursk more than a half-century ago passengers would see a stone fence with enormous letters: Gakéntal' Armature Plant and Manometer Factory. Although there was no longer any Gakéntal', the name remained. Behind the fence essentially lay a workshop, somewhat expanded during World War I, since it worked for defense. Now the Moscow Manometr Plant stands in this location, primarily producing sophisticated instruments for monitoring heat engineering processes.

Peasants from nearby villages, including the settlement of Mikhaylovskoye, where I was born, were drawn here to the Gakental' Armature Plant and Manometer Factory at the end of the last century. It was located near the Bittsa platform on the Moscow-Serpukhov highway. Now this is next to the circumferential road, while previously the village was 20 km from the capital. My father, Ivan Matveyevich Shakhurin, came to the Gakental' Plant together with his fellow villagers to work as a coppersmith. He was barely literate and could read and write with difficulty, but he became a good specialist as he had an enviable diligence and a peasant's grasp. He knew the copper-smith's work firmly and he was always esteemed for this at the plant.

My mother Tat'yana Mikhaylovna was the equal of Father. Nature had rewarded her with surprising emotional strength and the gift of inner tact. I was the oldest of the children. Mother worked a great deal. She slept no more than 5-6 hours a day. I don't remember her without work, either preparing a meal, washing or repairing clothing or washing us. We loved Mama very much and tried to make her daily concerns easier. If the oldest already could cut wood and wash the floor, the next son would watch the youngest. We were accustomed to work from childhood. We became independent when Father was called into the Army in January 1915--World War I was going on--and all family concerns fell on Mother.

I began working for hire from the age of 13--in May 1917 I entered I. G. Zabludskiy's electrical equipment office, which was located on the Kuznetskiy Bridge, as an apprentice. There was a church on the small square where the Kuznetskiy Bridge begins and a two-story house with basement farther in on the left side. This house was occupied by the office, with a sign stretching for about ten meters. Working in the city, and at such a tumultuous time, I moved on, as it were, to the next course of my universities of life experience. Although my pre-October production work lasted only six months, these months meant a great deal to me. The office was filling orders at enterprises and apartments and in addition it sold electrical commodities wholesale and retail. When calls came in I would go out with the electrician as his apprentice and assistant. The rest of the time I helped salespersons.

One of them, Konstantin Ivanovich Bol'shakov, young, always well dressed and a person to whom people were drawn, was a convinced Bolshevik in his views. Another, Aleksandr Ivanovich Tsygankov, about 50 years old, stout, with luxuriant whiskers like Skobelev and a crew cut, who usually wore a uniform without shoulderboards and patent leather boots, served with the police before entering the office. He did absolutely nothing although he was listed as a salesman: He would go around the room with his hands behind his back or he would sit in an armchair and doze. I think the boss kept him on just in case, as they say, until "better" times. No one had any doubt that these times would come. Tsygankov's main activity consisted of fierce political arguments with Bol'shakov.

These arguments, to which I was an involuntary witness, proved to be an excellent school for me. Power was still in the hands of the Provisional Government and the convocation of a Constituent Assembly had been announced. All parties had unfolded a broad agitation campaign in an attempt to attract future electors. For me, who had grown up in a village, overthrow of the

autocracy was an event which I had a hard time grasping. And here Bol'shakov was calling the overthrown Czar Nikolay the Bloody and, in his words, it seemed necessary to transfer power into the workers' hands, make plants and banks state property, give the land to the peasants, stop the war and conclude a long-awaited peace.

I observed the battles in the office with mouth agape. Soon I became a fervent adherent of Bol'shakov because everything he was saying about oppression of the people, their need and lack of rights was being experienced by our family. I could not and did not try to enter the arguments but had it come down to a fist fight I hardly would have kept from taking part in the scuffle, and it is clear on whose side.

When the monarchist lacked arguments he would begin to shout:

"Soon we'll hang you Bolsheviks on the lamp posts."

Konstantin would respond:

"And we regret that not all of you policemen and monarchists were executed in the February Revolution, but we'll correct this if the occasion presents itself!"

I had occasion to hear many such skirmishes and similar ones. I tried to attend rallies, of which there was no shortage. Inasmuch as we lived in the country and I took the train daily to work in Moscow--at least an hour one way--what didn't I hear. The time would pass imperceptibly. These were continuous rallies without a chairman. No one would look around to all sides and no one was shy before anyone. At that time there were approximately 220,000 workers in Moscow, of whom half were connected with the village. Workers with Bolshevik sentiments were saying that nothing good could be expected of the Provisional Government. An end to the war was not in sight and talks about freedom were vague.

Meanwhile events in Moscow were building up. The fall of 1917 brought radical changes. An armed uprising occurred in Petrograd on 25 October (old style). That day I rode to work as usual, hurried to Pokrovka and, just after passing Myasnitskaya ulitsa and Furkasovskiy pereulok, I heard shots. I ran to the office. The shots came more often.

The office did not open that day. No one came to work. After standing for about two hours near the closed door I began to make my way cautiously to the Kursk Depot.

I arrived home earlier than usual, which greatly surprised Mother. I explained that there was shooting in Moscow and the office was closed.

Having returned from the plant in the evening, Father (he had returned from the front because of a wound) said that a workers' uprising had occurred in Petrograd, the Bolsheviks had seized power and the Provisional Government had been toppled. Red Guard detachments of workers were being organized in Moscow.

I was not allowed into Moscow on the following days. Father rode to the plant alone. Each day the workers held meetings. Talks were being held with the Socialist Revolutionaries, Mensheviks, the commander of Moscow District, and representatives of the City Duma. Fighting began on 27 October. Workers discovered railcars with an enormous amount of rifles at the Kazan Depot. This helped the rebels a great deal.

Help for working Moscow came from Shuya, Vladimir, Yaroslavl, Mtsensk, Gzhatsk and other cities, from where detachments of workers and soldiers arrived. This all was of very great importance for victory of the revolution in Moscow. The Kremlin was encircled by the evening of 2 November, with detachments of almost all rayons preparing for its assault. Workers of the Gakental' Plant also moved on it.

The Kremlin garrison surrendered on 3 November.

I arrived in Moscow on 5 or 6 November. The office was open, but there was neither boss nor steward nor former policeman Tsygankov. The office ceased to exist and I found a job with a handicraftsman in Marino Grove who made electrical instruments, distributing boards and fuse panels. I performed various ancillary jobs and even turned an enormous wheel, substituting for an electric motor. The wheel activated a lathe and a drill through a gearing arrangement. But soon even this workshop closed and I again had to look for a job. Finally I was taken on as an electrician's helper in a brigade which was installing a turbine, electric motor and wiring in one of the suburban Moscow estates, which was being fitted out as a VTsIK [All-Russian Central Executive Committee] rest home, but this job was temporary. Devastation, starvation and unemployment reigned in the country. For the majority of plants, if they worked it was with a very light load. The country was beating off interventionists and White Guards pressing from all sides, trying to stifle the power of the Soviets.

Almost two years went by this way.

In 1920, when I was 16 years old, I went to work in the utilities department of the city of Podolsk, in a position called "city electrician." There also was a mechanic who kept an eye on the work of the motor and dynamo, which produced electrical power, and I monitored the external mains. There was meager street lighting and I had to change bulbs when they burned out. In such instances I would climb posts which had begun rotting and were held up God knows how. I sometimes worked both in establishments and apartments fixing the wiring. This was not very interesting.

I came to the Manometr Plant in the spring of 1922. At that time there still was unemployment in the country. They accepted me at Father's request out of respect for him. The work was not complicated, but it also was not easy. I became a hammerman in a blacksmith's shop. It was rather difficult to be a hammerman at 18 years of age, but they couldn't offer me anything else. I don't know whether or not blacksmith shops such as ours are still around somewhere. Possibly they still exist in remote villages. The room was dark and windowless. Air and light would come in through the open door and from the hearth. The sight of the red-hot coal and the smell of heated metal have remained in my memory forever. When the smith would snatch the hot billet from the hearth I

would beat on it with a hammer and the smith, seeming to play, would conduct his music by using a small hammer to point to the spot of the next blow. You would "play" so much in a day that you only wanted to get to bed. Later I was transferred to a milling machine in the tool shop...

After a year's work at the plant I began thinking about going to school. This idea did not leave me and finally I went to school on a pass from the Komsomol Raykom at the Central Club for Communist Indoctrination of the Working Youth, which was located in the building now containing the Soviet Army Central Club. After passing the necessary exams I obtained a place in a dormitory and moved there, but when I went to the plant party organization secretary to come to an agreement with him on the question of a new secretary for the Komsomol cell which I headed at the plant, I heard:

"We won't release you from the plant. You'll still have time to study later."

The party bureau assembled and passed a resolution not to release me.

I had to get my belongings from the Central Club dormitory and documents from the office and return to the plant.

A serious change occurred in my life in December 1924. I was advanced to work in the Komsomol raykom, to the political enlightenment work department. The party and Komsomol organizations agreed, and so I moved to the Baumanskiy Raykom, but remained in the party organization at the plant. Although three years is a short time, they were quite crammed with many events for me. I took part in organizing a Komsomol cell and was its secretary. I became a candidate for party membership and later joined the RKP(b) [Russian Communist Party (Bolshevik)]. I organized a Young Pioneer detachment.

The Manometr Plant holds a special place in our family's life in general. My father worked there more than 40 years and from there went on a pension and considered the Manometr his native plant until the end of his days. I and my two brothers also worked at this plant. No matter where I worked later I believed that the Manometr collective always had the right to demand an account of me, of what I was doing and how I was working, and if necessary even call me back if I was not justifying the trust given me as a worker advanced by the plant. The procedure then existing was that workers recommended for party, management and soviet work would give periodic accounts at plant meetings and they would be called back to the machine if they were not coping with their duties.

The thought of school did not leave me all this while. It is true that I studied at electrical courses in the evenings while still working at the plant, but this was not enough and I requested the Komsomol Central Committee to transfer me to work which I could combine with studies. In 1927 I was approved as Komsomol Central Committee representative to the All-Russian Committee for Industrial-Economic Education and appointed committee deputy chairman. In addition to the industrial-economic higher educational institutions sponsored by the committee, it also watched over tekhnikums with this profile and schools for office-trade apprenticeship. The Komsomol was vitally interested in all this. While working in the committee I had an opportunity to prepare in the

evenings for entering a higher educational institution and in the fall of 1927 entered the Industrial-Economic Institute, which later began to be called the Engineering-Economic Institute imeni S. Ordzhonikidze. I studied in the machinebuilding faculty.

At that time many people were showing an interest in aviation. Back in March 1921 the 10th RKP(b) Congress discussed measures for further building and strengthening of the Air Fleet. The party's call "Working people, build the Air Fleet," became the battlecry for youth of the 1920's. In March 1923 the Society of Friends of the Air Fleet was formed in the country. I showed a great interest in aviation and aircraft building and I began to work in the Marxist Technicians' Society where I listened to lectures and briefings on aviation subjects. In addition to theoretical disciplines I also underwent production practice during my studies. I learned foundry work at the Krasnyy Proletariy Plant, open-hearth work at the Serp i Molot Plant, and had industrial practice at the AMO [Moscow Automobile Society Plant], now the ZIL [Plant imeni V. I. Lenin], and at the 1st State Bearing Plant.

On completing the Institute, I was sent to one of the civil air fleet plants, and in 1933 I was transferred to the Air Academy and began to work there in the scientific research department. At that time the Air Academy imeni N. Ye. Zhukovskiy was the only higher military aviation educational institution preparing mechanical engineers, designers and maintenance engineers and provided retraining of aviation commanders. Well-known scientists, literally the flower of the country, taught here apparently because this was the only military establishment where cadres with the highest qualifications were being prepared for aviation.

In the first years of my work I was immediately subordinate to the Academy's deputy chief P. S. Dubenskiy. A prominent scientist and organizer of science, he was in charge of the scientific-technical committee of the Directorate of the Air Force before working at the Academy. Contact with him helped me broaden my overall horizons substantially and deepen my knowledge of aviation. Meetings with other prominent scientist-instructors and with the gifted people among the Academy's students in performance of my official duties played an important role in my life. As deputy chairman of the Academy's bureau of the Inventors' Society I was closely connected with its director Andreyev, who was chief of the maintenance faculty. I remember the outstanding scientists--I. I. Artobolevskiy, B. N. Yur'yev, N. G. Bruyevich, V. S. Pyshnov, V. F. Bolkhovitinov, V. V. Uvarov, B. S. Stechkin, V. P. Vetchinkin and others. Although my work basically was organizational, I had to understand what they were talking about, know the state of affairs and have an idea of the prospects for development of aviation science and technology. Soon I also was elected academic secretary of the Academy's science council.

Two Academy chiefs were replaced during my work. The third one was A. I. Todorskiy. Prior to the Academy he had directed the Red Army's higher military educational institutions. Aleksandr Ivanovich Todorskiy was well known in the Army. In its time his pamphlet entitled "With Rifle and Plow: 1917" was highly praised by V. I. Lenin, who called it a wonderful book.

I will tell what I remembered in particular.

English language classes were set up for instructors, but many attended them irregularly due to a heavy workload. Among these was V. F. Bolkhovitinov, who in addition to instructional work handled the construction of an all-metal bomber of his own design and of course he was heavily overworked. Then once came an Academy order in which Bolkhovitinov was reprimanded for nonattendance at these classes. Viktor Fedorovich went to the Academy chief to find out why he specifically was reprimanded when many were guilty of this violation. After hearing him out Todorskiy answered in his customary manner of pronouncing every "o":

"If I were to reprimand someone else it would have no effect. But if it's Bolkhovitinov, then everyone will get the idea it is a serious matter."

My memory retained one more among numerous other instances. Once, in passing through the round room of the Petrovskiy Palace, Todorskiy met Boris Mikhaylovich Zemskov, a well known Academy professor and one of the most respected, hurrying to the lecture. The bell already had rung five minutes ago and Todorskiy admonished the professor:

"Boris Mikhaylovich, you're late for the lecture!"

"Aleksandr Ivanovich," he heard in response, "I can't be late for the lecture: It won't begin without me."

"Of course," smiled Todorskiy, "it won't begin without you, but multiply five minutes by the number of students in your audience, and you will see how much knowledge they have lost."

Zemskov began to appear on time for the lectures.

It was very pleasant to be in contact with Aleksandr Ivanovich. A tall, stout man with shaven head, he would pronounce all his "o's" in an unhurried manner, and almost always spoke with a sense of humor. It was rare that his chubby pink face did not light up with a smile and when this happened his small eyes with whitish brows were almost invisible.

Todorskiy delved deeply into the work of the Academy's science council, which was quite noticeable to me as the academic secretary.

I had much work at the Academy. I was elected repeatedly to party entities of Academy subunits, and also was secretary of the staff party organization, then in early 1937 I also became a member of the party raykom. Despite such a load I worked with great interest. Initially I lived far from the Academy and so would leave home early and return late. At times a person would get so wound up during the day that he would forget about eating, and when he would suddenly think about it everything already was closed: both the dining hall and the canteen. Later they gave me an apartment near the Academy and this saved a great deal of effort.

One day in August 1937 I was summoned to the Leningradskiy Rayon party committee. The raykom secretary asked how I was working and getting along. I told everything as it was: The work was interesting, there was a lot of it, and there was nothing to complain of. After hearing me out the secretary said:

"Tomorrow I would like you to be in the Moscow party committee at nine o'clock in the evening."

I appeared there at the designated hour and there was an unexpected discussion.

I was offered the position of Central Committee party organizer at an aviation plant.

I responded that I wouldn't want to leave the Academy as I liked the present work.

"There is a guideline now to send engineers to party work in industry."

Then I remarked that I wouldn't want to leave the Army. By that time I already had the rank of military engineer second rank.

"You'll remain in the Army cadres."

There was no more reason to object:

"Well I'm ready if necessary."

"That's fine. You will be summoned to the Central Committee in the next few days."

The aviation plant where I began work as VKP(b) [All-Union Communist Party (Bolshevik)] Central Committee party organizer was one of the enterprises of the aviation industry. At that time the plant was being reorganized for the production of new aircraft. An all-metal American aircraft was being placed in production. A large amount of modern equipment purchased abroad was being assimilated--trip hammers, presses and special machine tools. The party organization at the plant numbered over a thousand persons. Now such an organization operates on the basis of a raykom and unites an entire network of primary party organizations, but at that time everything was straightforward. Everything was decided at a general meeting. It was well that there was a capacious sports palace in the vicinity. Over 2,000 persons assembled there for open party meetings.

Inasmuch as I was Central Committee party organizer the raykom recommended to the general party meeting that I be elected secretary of the plant party committee as well. Other party members--workers and engineers who were well known at the plant and who had full trust--also were elected to the party committee together with me.

At that time Sidora, in the past the director of the Kharkov Tractor Plant, was plant director. He was a competent person who knew production, but prior to this he had not built aircraft and so felt rather uncertain in his new calling.

Plant chief engineer Shekunov, to the contrary, was an experienced aircraft builder and an engineer with a long period of service, but with the plant being reorganized for new technology and new equipment he did not show the necessary resolve.

Delving into everything and talking with heads of services, both party members and nonparty personnel, I saw that the rate of plant conversion to the new production was very low and there was no firm, confident leadership. I realized that support must be sought from the party aktiv and staff workers, that they should be turned to above all and armed with new tasks and plans. The plant collective deserved the highest praise. Many had been working at the plant for a very considerable time, often entire families--father and sons. The workers had very high qualifications. They were able to make complicated parts from a diagram drawn by designers, and at times even without diagrams. Kurskov, foreman of the copper shop, would demonstrate his techniques on the stage of the plant club. These were people brought up on aviation traditions. If it was necessary to do something, especially for the Army, the plant collective considered it a matter of honor to fulfill the order with quality and on time.

All kinds of difficulties arose every day, and the party committee and I as Central Committee party organizer had to decide a great deal. This is what I was engaged in in an attempt to delve into everything thoroughly and with benefit for the plant. Soon I was elected a member of the Leningradskiy Rayon party committee bureau. This of course added new concerns.

At first I worried a great deal in convening general party meetings and bringing up matters of party or economic work there. Little time was set aside for a particular matter. A brief announcement, one person would speak for, another against, there would be a maximum of another one person each and they already would be shouting: It's clear, let's decide. The thought would occur as to whether or not they were able to decide so quickly, for I would sit for hours with a particular person. Was it the correct decision? The fact is we were talking about important matters, often about the fate of party members. And each time I saw with surprise and joy that they decided correctly despite the brevity of discussion. Apparently a knowledge of people, party principle, and a working, class feeling faultlessly suggested in the absolute majority of instances how to proceed. The people immediately sensed a lack of sincerity and a desire to go around sharp corners and they would react immediately. I didn't see any passive people at party meetings, let alone in the aktivs. It was a remarkable collective.

Elections to the USSR Supreme Soviet were held for the first time in 1937. Everything was being done for the first time: advancement of candidates and proxies, staffing electoral commissions, and the selection and arrangement of spaces. Meetings often would be held under the open sky because there were so many people. When electors assembled from all districts they would head for Dinamo Stadium. The preparation and conduct of meetings required a great deal of concern and trouble. Added to this was the weekly briefing of agitators and talks with them, and there were hundreds of them... But we also coped with this matter.

The plant continued to assimilate new equipment and new technology. In place of the manual punching of engine housings, propeller spinners and other articles we began to process them automatically on trip hammers. Many parts were manufactured in a press, and duralumin profiles were made in creasing machines. Some things were converted to welding. The plant was renovated. A standards shop, fuselage shop, undercarriage shop and so on were set up. There was an improvement in processing of the power plant, in the arrangement of the job of preparing aircraft for trial flights and in conducting the trial flights themselves.

My life was entering a new rut, but fate saw fit to intervene again. On a Saturday in late April 1938 I again was summoned to the Central Committee after work.

"The Central Committee is recommending you as first secretary of the Yaroslavl Oblast party committee," I was told. "You must assemble the party committee today and turn over your affairs, and tomorrow travel to Yaroslavl. An obkom plenum is being convened there Monday morning."

I realized the matter had been decided without me.

"But when will I assemble the party committee, for everyone has left the plant until Monday?"

"Assemble the party committee today."

Thus began my party work on such a scale about which I previously could not even conceive. In telling about myself at the plenum of the Yaroslavl party obkom I pledged to bend every effort to justify the trust of the Central Committee and oblast party organization. I was elected obkom first secretary and party gorkom first secretary.

The majority of those working in the obkom and gorkom were young, capable people dedicated to the cause. A. D. Krutetskoy, a very knowledgeable person who was closely connected with the party aktiv and the masses, was chief of the party organizational department. The ideological sector was headed by well-trained propagandist and organizer A. N. Kuzin, later chief of the press department of the VKP(b) Central Committee and chairman of the Radio Broadcasting Committee. The gorkom second secretary was V. Ya. Gorban', a notable organizer, fundamental party member and engineer. Later he worked as secretary of the Moldavian Communist Party Central Committee. The Komsomol Obkom secretary was Yu. V. Andropov, who received a good conditioning in the Yaroslavl Obkom.

Yaroslavl Oblast at that time also included the present Kostroma Oblast, a total of 52 rayons. The industry was diverse: machinebuilding, motor vehicle and tire plants, a synthetic rubber and paint and varnish plant, the Krasnyy Perekop Textile Factory, a flax combine and other enterprises. Agriculture also was multisectorial, with its pride being the famous Kostroma breeds of cattle as well as the widely known Tutayev oats. There were many forests, which means a large forestry. Peat production was extremely important. The heat and electric power stations worked exclusively on peat, supplying power

to enterprises of neighboring Ivanovo Oblast as well. It was such a long, drawn-out affair and so much trouble with peat alone that if you didn't look sharp, keep an eye on things, and give prompt assistance all the plants and factories would halt and the entire industry of two oblasts would come to a standstill. There were those difficult months when just enough peat would be produced and then we worked without any reserve at all, from the wheels as they say. This alone kept us under a constant strain.

But there was so much other work, for literally everything concerns an obkom secretary--the work of plants and factories, the status of agriculture, food supply to cities, providing people with housing, the work of bathhouses, laundries, theaters, clubs and so on. And everywhere were unique features. Although I spent my childhood years in a village near Moscow, I had never seen a crop such as, for example, flax with my own eyes. Planting was coming on. With what should we plant, would there be enough seed, and how about the equipment? And the people? In traveling through the villages I saw many boarded-up houses. A workday had very little weight at that time and people headed for the cities, to timber exploitation areas and into peat production.

There were primarily young but capable party members working in the party obkom and gorkom as well as in a majority of the raykoms. Almost all of us lacked experience but, most important, we tried to function collectively and in concert. This rid us of excessive mistakes. We would exchange opinions on particular matters with other obkoms by telephone and would turn rarely to the Central Committee. When complicated questions arose we usually would seek advice from a certain department, or on special occasions from the secretaries, with a proposal already prepared because they would ask without fail: "And what do you suggest?" Most often they would agree, but sometimes they would say: "We will talk things over and give you our opinion."

The work in the oblast fascinated me. There were major important, interesting matters and a great deal of anxiety, and sometimes even alarm. You had the feeling that there was incomplete work in one place and something had not been checked out in another place. You wanted to be everywhere yourself and see everything with your own eyes.

I rode out to the peat mining, where women primarily were working: our dependable Russian women. They were doing everything with a smile and a joke. They didn't ask for much--special footwear for working in the marsh, a hot meal nearby and a good attitude. How important a good attitude was, sometimes substituting for all the rest. I spent time at the peat mines and it became clearer what had to be done further to support this sector more and so that it caused fewer alarms.

I returned and found that the All-Union Conference on Timber Exploitation Areas was assembling and I was being called to this conference. Again I had to drive into the forest and have an on-the-spot look at "why the birch grows." We learn the workers' needs and think how to raise labor productivity in this sector. People's Commissar of the Timber Industry N. M. Antselovich, a great enthusiast of the country's forestry, spoke at the conference. I listened to him with great attention, for our oblast was forested and things were not going very well.

In the fall came the harvest and grain procurement. It was at this very time that the rubber combine began to operate poorly. A representative rode out from Moscow and we went around the shops. We called a meeting during the day at the lunch break and a party aktiv in the evening. Soon Central Committee Party Organizer N. S. Patolichev, a remarkable, knowledgeable organizer, arrived at the combine. Work began to be adjusted and the people's mood rose even though not everything was going as yet as we would have liked.

Winter came and again there were unique difficulties, and much again for the first time. It was a great strain but confidence had come and this is half the battle.

A call came from Moscow in the middle of winter:

"Come tomorrow to report on the obkom's work at the Central Committee organizational bureau."

"What do you mean tomorrow? Isn't it necessary to prepare?"

A voice over the phone said:

"Don't you really know what you're doing?"

"I do."

"Well then report on this. In addition a Central Committee inspector has been at your place for around a month already, so that we expect you tomorrow by ten o'clock in the morning."

They hung up and I couldn't come to my senses. A report in the Central Committee, and the first one at that, was no joke. And here it was tomorrow. At first I couldn't imagine at all where to begin preparing. It was one o'clock in the afternoon and the train to Moscow left at eleven in the evening. That's all the time there was. I called in the obkom and gorkom secretaries and department chiefs. I told about my summons to Moscow and asked what ideas they had. Everyone began talking at once. When the noise abated a bit I said:

"We won't have time to write a report. That's clear. Then let's identify the most important things."

I had my say and they began adding: This has to be mentioned, and this. I announced to those assembled that a Central Committee inspector had been with us for around a month now.

"Who has seen him?"

It turned out many had seen him and he had even talked with some people and had been in the rayons. Everyone believed that there was no doubt I knew about him, only for me this was news.

Several comrades went to Moscow with me, and together with us the Central Committee inspector. I asked him:

"Why didn't you come in to see me?"

His answer was simple and laconic:

"There weren't any vague issues."

We were delayed at the train station in Moscow as the vehicle sent for us did not arrive on time. When we entered the assembly hall we heard the voice of Chairman A. A. Andreyev:

"Well the Yaroslavl people have arrived. Comrade Shakhurin has the floor."

And he added:

"You have 15 minutes to report about the obkom's work."

At this time I was still walking from the entrance door of the elongated hall, on both sides of which stood tables with swivel chairs, with a long table with a large rounded area in front. Sitting there were members of the Secretariat and Organizational Bureau--A. A. Andreyev, A. A. Zhdanov and A. S. Shcherbakov and chiefs of VKP(b) Central Committee departments. I saw Nadezhda Konstantinovna Krupskaya and Rozaliya Samoylovna Zemlyachka in the room. When I went up to the rostrum I realized that the theses of the report prepared in the obkom were not apropos as it was necessary to speak on them for at least an hour. Therefore I began to reorganize on the move. Initially it seemed to me that it turned out a bit confused and inconsistent, and then more and more confident and enthusiastic. I told how the Yaroslavl party organization was working, what we had succeeded in doing, where we had failed and why, and what we were planning for the future. Accustomed to military discipline back during my work in the Academy, I kept within the allotted time.

I was asked several questions and in answering one of them I began "drifting."

Zhdanov asked:

"What are your numbers for flax?"

I had not yet become well oriented in flax growing and began to look for help from the obkom secretaries, but I just couldn't understand what they were suggesting. I answered from what I could recall:

"Three and a half."

Shcherbakov said:

"That's low."

Zhdanov agreed with him.

The discussion period began. Everyone spoke positively about our work. Andreyev suggested considering it satisfactory and that evaluation was accepted. I received a nod that I could go and I went to the tables where the Yaroslavl people were sitting, still not understanding very well that the most important was behind me. When I passed by the table where Krupskaya and Zemlyachka were sitting Nadezhda Konstantinovna stopped me:

"Comrade Shakhurin, many thanks for your briefing."

Like everyone in our country, I had great respect for Krupskaya. I was somehow astounded by this gratitude and asked quite sincerely:

"But for what?"

"You see," said Krupskaya, "usually obkom secretaries speak in figures and percentages about the work of industry and agriculture, but you spoke about the people. This is very fine and interesting, and in a party manner."

I left Nadezhda Konstantinovna with the feeling that I had received a great award.

We dined in a good mood and already were planning to return when I was told that they were looking for me and I had to report to one of the Central Committee workers. I went to see him and heard:

"They decided to recommend you to be secretary of the Gorkiy party obkom."

"How can that be? I have done so little in Yaroslavl as yet, there are so many plans and now to leave?"

I was told:

"Gorkiy is an even more difficult oblast."

And then, this time more categorically:

"Telephone instructions to assemble the Yaroslavl Obkom Plenum for tomorrow. Give an account and leave for Gorkiy in the evening. We will recommend Patolichev as obkom secretary in Yaroslavl, we know him."

I dropped in on the comrade who was handling the Gorkiy Oblast party organization and asked him to tell how things were going there and where attention should be given. I was told that a rather good comrade was working there now as first secretary, but he didn't have the engineer training necessary for such an industrial oblast. The party organization in the oblast was firm and strong, with good traditions. It was necessary to find the path to the heart of the aktiv and to the staff workers. The comrade added with a chuckle:

"If you don't consult with the Sormovo people and drink some tea together nothing will go right. This is a tough nut and is not within everyone's capability."

There was alarm in my heart as I still had little experience. How would everything turn out? I called home and said that it was necessary to get ready for a move:

"There's only the Volga in Yaroslavl," I said. "Now we'll go where there is both the Volga and Oka."

Gorkiy produced a strong impression on me, with enormous industrial power striking the eye above all: Krasnoe Sormovo, the motor vehicle plant, a machinebuilding plant, a machine tool building plant and much more. Then there were the old things: Near the train station was the former building of the Nizhegorodskaya Fair, a bit higher the ancient Kremlin and former governor's house, an opera and drama theater, university, museums, as well as the famed garden slope on the descent to the Volga where music always plays on summer evenings. And there was nature--the magnificent confluence of the Volga and Oka. The so-called spit was visible from the obkom windows.

It was January 1939, with the 18th party congress coming up in March. It was necessary to dig into affairs, become acquainted with the people and hold rayon, city and oblast party conferences. There were more than enough difficulties, with primary attention naturally to industry. In addition to Gorkiy itself, this meant Dzerzhinsk with its chemical industry as well as Murom, Pavlov and Vyksa, where metallurgy and machinebuilding were concentrated. There also was a vast handicraft industry, from the skilled Pavlov craftsmen who made wonderful knives with an infinite number of elegant objects to the splendid Semenov handicraftsmen who manufactured millions of wooden spoons, salt shakers, little dippers and so on.

In preparing for the rayon and city party conferences I spent much time in local places and became familiar with the oblast leaders and the state of affairs. The time came for the city party conference in Gorkiy as well, and it had to happen that a hitch occurred in electing the presidium. When I asked whether or not there were objections to the nominated membership one of the delegates rose:

"I object to the gorispolkom chairman."

The reason was that when the gorispolkom chairman worked at one time as shop chief at the plant an accident had occurred in this shop. It seemed the question was raised at that time even about bringing him to trial.

"This is why I propose to reject this candidacy."

My position can be understood. For the time being I was alone at the presidium table and had no one to consult. I decided to address the room directly and asked who else wanted to say something on this matter. There was no one. I looked at the secretaries and the aktiv and they were silent. It seemed necessary to move on to voting, but that meant to agree with the challenge. Then much more would follow. The comrade most likely would not be elected to the gorkom, and therefore as gorispolkom chairman. And where are you, obkom secretary? Where is your responsibility for selection of personnel?

I asked the delegates for permission to express my thoughts and began by saying that I was surprised by the silence of those who at one time had nominated Comrade Yefimov for this work. Had they really not known about the accident? I had been in the Gorkiy party organization only two months, but I had met the gorispolkom chairman several times already, heard his reports about the status of the municipal services, and I had formed an impression of Comrade Yefimov as a party member of principle, a knowledgeable engineer and capable economist.

"Therefore," I concluded, "I believe that he can be elected to the presidium."

Yefimov was elected unanimously to the presidium, and at the oblast conference he was elected delegate to the 18th party congress. Later he was in important party and economic work for many years.

The Gorkiy party organization was healthy, and so it remained. The party members could criticize the obkom or gorkom and its workers very strongly or support such criticism, but if elements of hypocrisy and personal accounts appeared in this criticism they immediately rejected everything superficial and supported the leaders. I have retained bright memories of this, as in general about work in the Gorkiy party organization. The party members received a person well who spoke honestly about difficulties and set tasks in a businesslike manner.

The conferences went well on the whole and we arrived at the congress with great enthusiasm.

Despite the fact that I lived almost next door with the obkom I would leave home early in the morning and return late at night. I would eat dinner in the obkom dining hall for no more than 20 or 30 minutes and that was the only break in the entire day. That's how everyone worked. When it became difficult and, I will say honestly, even unpleasant (and that happened rather often for in a majority of cases you were working on those matters which were "inhibiting" and you would straighten things out where it was going poorly), then I would travel to some plant and this would return the necessary mood. You would go around the shops, have a talk with the leaders and workers and again feel a surge of energy and receive the necessary charge.

The time came and the Gorkiy delegation set off for the 18th party congress. In addition to the Central Committee Accountability Report, the congress was examining the 3d Five-Year Plan for development of the USSR's national economy for 1938-1942 and changes in the party Bylaws. I had occasion to speak during discussion of the Accountability Report. The congress had outlined great perspectives and high growth rates in all sectors of industry and in agriculture. To improve the food supply it was decided to set up potato-vegetable and animal husbandry bases around the major cities, including Gorkiy, which would fully provide the centers with vegetables, potatoes and, to a considerable extent, with milk and meat. How this helped out the residents of many of the country's cities in the war years!

A congress is a great event in the party's life. This is a review of the ranks and a summing up of what has been achieved. It is also a rough draft for the

future: what path to take further, what to do on a priority basis, and where to focus basic efforts of the party and people. These also were days of great solemnity for every party member, and especially for congress delegates who had been given special trust and responsibility.

All delegates from Gorkiy had been elected for the party congress for the first time and so our excitement can be understood. Trying to understand reports and speeches, preparing our own speeches, giving mutual information about especially difficult upcoming matters, and holding evening meetings with certain people's commissars--all this took up the time fully and without anything left over. I was elected a member of the congress presidium and in elections of leading entities I also was elected a member of the party Central Committee. This generated a feeling of great responsibility. I had received so many advances already which had to be justified.

Spring turned out to be difficult and arid, without a single rain. The threat of the loss of winter crops and spring crops was gathering steam in the oblast's southern rayons. I had to consult with oblast and rayon workers and kolkhoz chairmen almost every day. I recall I conversed especially often with M. Saberov, chairman of the Alga Kolkhoz, a talented and experienced person and a deputy to the RSFSR Supreme Soviet. Saberov was a Tatar and the majority of kolkhoz members in the kolkhoz he directed also were Tatars. He spoke Russian poorly and had learned Russian while working as a delegate, but everyone at a conference would listen to his every presentation with great attention. At one of the last discussions held in the obkom Saberov said that if there was no rain in the next three days in the southern rayons everything would have to be replanted, but where would the seed come from? And what would the replanting provide if there were no rain? These questions were very alarming. On their days off all workers of the party obkom and oblispolkom would set off for various rayons, and naturally I did so as well. You would be driving along and there would be an enormous cloud of dust behind the vehicle, it was so dry. Then the rain did come in some places and the seedlings perked up a bit, but we also had to replant partially. A difficult spring gave rise to a difficult summer. In the fall we decided to move some of the cattle to the northern forested rayons for wintering. Things were better there with the harvest and hay procurement.

The Volga Steamship Company, the administration of which was in Gorkiy, demanded attention with the beginning of navigation and timber rafting. If for example timber was not moved down the river during the winter for the Balakhna Paper Combine, then it would have to be transported by railroad one train each day, and this was costly. Mother Volga accomplished a great deal of work without much fuss. But was this all? Barges would extend down the river with building materials, oil, manufactured articles and so on. The chief problem for the Volga Steamship Company was cargo handling operations and their mechanization so that the steamships and barges did not remain too long for unloading and loading.

Despite the fact that leading workers at the plants were experienced and knowledgeable and primarily party members the help of raykoms and the obkom still was necessary. At times it was difficult for the plant itself to decide

many things. The motor vehicle plant, for example, was being let down by suppliers and it was necessary to intervene. Casting, rolled products, chemical articles, rubber, electrical equipment and much, much more was required by this giant in order for the conveyor to function rhythmically and for products to be shipped off daily, so that the obkom always had to be on guard. At times a telephone call to the secretary of another obkom or a message to the party organization of the supplying plant did a great deal. And so it was for other plants as well. Each one had its own difficulties. The oblast itself helped out many enterprises, especially small ones.

Trade, supply of the population with food products, and operation of dining halls demanded daily concern. It would happen that in the morning you would drop in at the market, go through the stores or send someone to the working rayons to see what they were trading. I often began the workday with a call to the trade department chief with the repetitious question: What are they trading today? They would report such-and-such and I would ask:

"Where, to which stores?"

But I myself already knew what hadn't been "thrown in" or what already was lacking. Why? I require a check and a report, and not by telephone, but personally.

There was a reception hour without fail in the evening for requests and petitions. Generally there was much work and the work was unique.

In recalling my work in Gorkiy I would like to mention something with seemingly no direct relationship to the work of the Gorkiy party organization, but nevertheless still connected with the life of the oblast and city and with aviation. It is generally known that Valeriy Pavlovich Chkalov, one of the most renowned Soviet pilots, considered himself a native of Gorkiy. All his relatives lived near Gorkiy in the village of Vasilyevo, where he was born. A person with a broad Russian soul and brave heart, Chkalov loved his people and his countrymen and they repaid him with the very same sincere love. He often would travel to Gorkiy, to the places dear to his heart. While visiting relatives he would take them on a plane ride and he would go hunting.

When I began working in Gorkiy I saw how they cherished the memory of Chkalov here and the obkom decided to put up a monument to Chkalov. We chose one of the most beautiful places on the slope at the Volga near the Kremlin. The monument was created by sculptor I. A. Mendelevich, a friend of Chkalov's. It was then that the tradition became established for Chkalov's birthday to be celebrated in his native Vasilyevo-Chkalovo. I remember when his friends and comrades in arms got together for the first time--Heroes of the Soviet Union G. F. Baydukov and A. V. Belyakov, his wife Ol'ga Erazmovna, son Igor' and numerous guests from various rayons.

I rode to Vasilyevo with Chkalov's friends in a launch, the motor of which--an M-11 aviation engine--was presented to Gorkiy residents by Valeriy Pavlovich. The launch rushed us along swiftly and created the impression of flying. Such speeds now are nothing unusual. Hydrofoils have become firmly current,

but in far-off 1939 our launch seemed the limit of perfection. Thousands of people had assembled in Vasilyevo and a meeting was held in a large clearing. Chkalov's comrades in arms and the Young Pioneers spoke. Fighter aircraft appeared in the sky at the very height of the holiday, flying in threes, one flight behind the other as if to show that Chkalov lived in the pilots' hearts and in these aircraft.

A real holiday resulted and after the meeting we went to Chkalov's house.

The house stood on the very slope above the Volga. A long bench was set up along the front garden. We were photographed sitting facing the Volga. At this time several men were bringing in a seine. The fishermen decided to treat Chkalov's friends to fresh sterlet chowder. In looking at them one could not help but recall the photo of Chkalov at Vasilyevo with trousers rolled up bringing in a seine. When the treat was ready everyone sat down at the table. The faces of people related to Chkalov shone with happiness, perhaps because that day so many kind words were said about Valeriy Petrovich and because of how much good he had left in the people as their true son. On returning to Gorkiy toward evening we sensed that this day would be long remembered.

The Soviet-Finnish War lasted from late November 1939 through March 1940.

I remember the evening of 31 December 1939. The majority of the obkom workers had gone home to prepare to celebrate the New Year. A telephone call came from the Central Committee at eight o'clock in the evening:

"Someone wants to speak to you now."

I thought that the people in Moscow wanted to congratulate the obkom workers with the upcoming New Year.

But I was told:

"As you know, winter is very severe this year. The soldiers are freezing in Karelia. Gorkiy Oblast can help. Figure up how many tens of thousands of caps with ear-flaps you could supply, as well as fur mittens and sheepskin coats. Report on the dates by which you can do this."

"When is this information needed?"

"Today before midnight."

"Today?" I asked in surprise. "But for this many people must be called in: workers of producer cooperatives, the hunting league and trade, sewing industry workers, representatives of tanneries and so on, but they all have departed to celebrate the New Year."

"It will be necessary to call them."

This was a check of the mobilization readiness of leading cadres as it were. Some assembled the necessary workers of oblast and city organizations, and some called up the rayons where the tanneries and fur trade were located.

Those called assembled quickly. They realized both from the time of the call and the tone of the conversation that everything had to be done and in the shortest time possible. We briefed the Central Committee on the latest information about which we had been asked on 1 January 1940 at three in the morning. Later we congratulated each other on the New Year which had arrived and drove to our homes.

I couldn't imagine that nine days later I no longer would be in Gorkiy.

#### One and a Half Years to War

By the time I was appointed people's commissar of the aviation industry it was quite clear that we could not avoid war. No one also made a mistake regarding the presumed enemy. This could be only Hitler Germany.

In 1940 our aviation industry was producing fighter aircraft which developed an average speed of 420-450 km/hr (only the latest modifications of the I-16 had a speed of some 500 km/hr). They were armed primarily with conventional machineguns. But the best foreign aircraft had speeds approaching 600 km/hr. The British Spitfire, the German Messerschmitt-109 and the American Aircobra moreover were armed with heavy-caliber machineguns and cannon and they took on a considerable reserve of shells and cartridges. Our combat aviation had to move to a new level and make a qualitative leap so as not only not be inferior to the aircraft of fascist Germany and other countries, but also to surpass them in flying, tactical and combat aspects.

This work already was being carried on. In early 1939 the party Central Committee and government mobilized all the country's designer forces to attain this goal. While previously our aircraft were designed only in a few KB's [design bureaus], above all those of A. N. Tupolev, S. V. Il'yushin and N. N. Polikarpov, now all designers who could make a contribution were used to create aircraft. New design bureaus and groups were organized in which combat machines were developed. Young engineers A. I. Mikoyan and M. I. Gurevich, S. A. Lavochkin with V. P. Gorbunov and M. I. Gudkov, A. S. Yakovlev, M. M. Pashinin, V. P. Yatsenko, V. K. Tairov and others competed with each other and with more experienced designers for the right to place their aircraft into series production. Of course, despite the conditions created for them the young collectives were in a more difficult position than the old ones, which unquestionably had both greater experience and a better production base. But the young designers received a full opportunity to show themselves despite many difficulties thanks to support of the government and the People's Commissariat of the Aviation Industry.

The very complicated aircraft of Mikoyan and Gurevich was created in a six month period from the beginning of design work to manufacture of a test model. This is an unusually short period when we consider that at this time the KB collective itself was forming. The young designers were at a plant where the design bureau was headed for a long time by Nikolay Nikolayevich Polikarpov, creator of the best fighters in the world for the mid-1930's.

I well recall a trip to this oldest plant in the country. When I arrived there with Smushkevich we saw that the entire plant collective was living and

breathing the new machine. After familiarizing ourselves with progress of preparing the "Mig" for flight tests we arrived at the decision to begin them as quickly as possible.

It was then I saw Artem Ivanovich Mikoyan for the first time. He was a relatively young man, not yet even 30 years old. Mikhail Iosifovich Gurevich was a bit older. At one time he had completed the aircraft construction faculty of Kharkov Technological Institute, designed gliders and worked at aviation plants. A thoughtful engineer, Gurevich was Mikoyan's coauthor in creating the new aircraft. They supplemented each other excellently. Artem Ivanovich was a talented designer who was able to stir up a collective. I didn't hear general words and ideas from him. In explaining a particular phenomenon or telling about his machine he was concrete and boldly took to solving new problems.

The aircraft of Mikoyan and Gurevich gave a very good showing. At an altitude of more than six kilometers it would develop a speed of 640 km/hr, which at that time not one Soviet or foreign combat aircraft had reached. The "Mig's" armament was strong enough, although it did not have a cannon. It is true that this fighter was less maneuverable than similar machines of other designers, but on the other hand it was a rather good night fighter-interceptor which became operational with border districts and fleets as well as the Air Defense Forces for defending important industrial and other facilities. The "Mig-1" and the "MiG-3" which soon followed entered series production before the others and began to be produced in ever-increasing numbers.

We also spent time with Lavochkin. The situation was most complicated for this designer. Mikoyan's KB was accommodated in the shop of an experimental plant, while Lavochkin's was located at an enterprise which arose on the base of a furniture factory, one of those the aviation industry received on the eve of the war. The factory produced furniture for the Palace of Congresses, but its construction was halted and the factory was used in a new capacity. The design bureaus of Pashinin, Tairov and some others also were in a similar position. Everything was being done not at the experimental plant, but at the series plants and with the help of these plants, and so the manufacture times of aircraft, including the "Lagg," proved to be somewhat longer. Nevertheless, in comparison with the periods which had existed in Soviet and foreign aviation construction, these time periods were extremely brief.

Lavochkin and his companions in arms Gorbunov and Gudkov put their entire soul into the aircraft, and the model turned out to be elegant, excellently finished and polished like a piano. The aircraft even was called a "piano" at times. But of course this was not the key factor. The finishing work merely improved the aircraft's aerodynamic characteristics. In the tactical sense the "Lagg" had very many merits, although initially it was also not devoid of certain deficiencies. During the first period of the war, armed with heavy machineguns and at times a cannon, it became one of the basic front fighters.

Semen Alekseyevich Lavochkin was the leader in a designer triumvirate. It is true that initially he, Gorbunov and Gudkov even tried to report all three together, but in time everything fell into place. Despite his youth Lavochkin had covered a long path and had worked with many prominent designers in the

country and even already had designed his own aircraft somewhat earlier. A person of great erudition, Semen Alekseyevich knew his machines inside out. In coming in contact with chief designers and talking with them on various matters I saw that Lavochkin would report on everything himself without assistants and always covered a particular matter extremely thoroughly. Semen Alekseyevich had bypassed the positions of deputy and first deputy chief designer. He became a chief designer immediately after moving from the People's Commissariat of the Aviation Industry, where he lately had worked with Gorbunov and Gudkov, into design work.

In an attempt to understand everything in the best way possible, Lavochkin delved deeply into matters connected with his profession. It is noteworthy, for example, that Semen Alekseyevich was first to undertake a bold experiment. He used a new material in his aircraft--delta wood, multiple plywood impregnated with a special resin compound which to a certain extent conceded nothing in hardness to metal and practically did not burn. The wood had been used in aircraft construction earlier, but Lavochkin used the delta wood in spars, ribs and other "carrying" structures which before had been made only out of metal. When we were left almost without aluminum at the beginning of the war Lavochkin's aircraft did not suffer from this. It is true that the plant where delta wood was manufactured was on enemy-occupied territory, but we had the timber and production of the "aluminum substitute" was organized in the Urals.

On learning that Lavochkin was using delta wood in the aircraft, Stalin also wanted to become familiar with this material. I was with Lavochkin in Stalin's office. Stalin listened to the designer's briefing with disbelief and then, going up to the conference table on which lay a spar and rib made of delta wood, he removed his pipe from his mouth and, turning it over, placed it on the wood while it was burning. It did not even char. Then Stalin took a pen knife from the writing desk and began scraping the plywood surface. All efforts were in vain. The wood proved to be hard as rock. Stalin brightened up before our eyes.

"The one who invented this must be rewarded," he said.

Leontiy Iovich Ryzhkov, chief engineer of a propeller and ski plant and inventor of the delta wood, soon was decorated with an order.

Many acute moments arose in our joint work with Lavochkin. Frankly speaking, I was not a very "pleasant" person for Semen Alekseyevich. I often had to "press" him and demand something, especially in accelerating finishing work and improving his fighter. But even under the heaviest pressure Lavochkin was in no hurry to give assurances that everything would be done, as sometimes happens. Only on being convinced that what was being suggested was possible to accomplish would he give consent in an even, almost quiet voice. I noticed that when it became very difficult for him he seemingly became more stooped as if a "mountain of adversities," those unfinished things which were in the aircraft, were pressing on him. But even at other times, when his aircraft were being eulogized, he didn't turn cartwheels and for the most part was preoccupied, but now by future machines and the difficulties connected with them.

A person of rare self-control, Semen Alekseyevich never raised his voice at anyone and never was abrupt with anyone. In the most acute situations he did not lose control and even spoke quietly and with constraint about matters concerning which it was only possible to shout. High culture and education distinguished him in everything. It would happen that I at times would raise my voice when talking with him--such situations were created during the war--but later when the acuteness of the moment had abated I felt guilty before Semen Alekseyevich. This person forced himself to be respected by his entire appearance.

Many of Lavochkin's innovative ideas have not lost their value even today. He was one of our first designers to understand the need for mastering new branches of knowledge which were determining the future of aviation--aviation of supersonic speeds and great altitudes. Even during the war years Semen Alekseyevich set up laboratories which permitted organizing the designer's work in a new way, and after the war this matter was arranged with him as with no one else.

As I already said, I became acquainted with Aleksandr Sergeyeovich Yakovlev in Stalin's office. Before this I practically did not know him. Yakovlev essentially also became a real designer of combat aircraft at this very time. Aleksandr Sergeyeovich was a person of self-discipline who was reserved in conversations. He said little even on matters which he knew well. There was in the designing of aircraft and in those requirements which he placed on people the desire to create a certain culture in work so that this somehow also affected the design itself. The design bureau spaces and Yakovlev's office were distinguished by a special style. On becoming a deputy people's commissar Yakovlev received great opportunities to develop his ideas.

At this time A. S. Yakovlev's KB was developing the famed "YaK"--the most mass-produced fighter of the Great Patriotic War. Just the first tests of the aircraft, which later was designated the "Yak-1," showed the high aerodynamic qualities of the new combat machine, which were improved many times during the war. The fighter was very well conceived, which made it possible to modify it on a broad scale, turning it into a multipurpose aircraft. By the war's end a speed of 745 km/hr was reached in the "Yak-3" combat fighter with boosted engine, which was almost the limit for piston engines.

In speaking about the strenuous work of aviation engineering thought and the successes of designers who were at that time young but known throughout the world, I cannot help but mention the enormous efforts to create aircraft on the part of our most experienced designers, with Andrey Nikolayevich Tupolev, a giant of the aviation world, being the first I would mention. A prominent Soviet designer, a creator of aircraft which made Soviet aviation famous, and a major organizer of aircraft construction, Andrey Nikolayevich was surprisingly young at heart. He not only taught others, but also constantly learned himself, absorbing all that was new in aviation theory and practice.

Andrey Nikolayevich was the teacher and indoctrinator of a large number of prominent Soviet designers about whom independent design bureaus later formed. Younger designers studied design work in higher educational institutions and

in the Air Academy and study it to this day on the materials of his aircraft. The work of A. N. Tupolev as a prominent scientist who carried out a number of original theoretical ideas in practice in his own designs advanced him to the pinnacle of man's scientific knowledge in the sphere of aviation. In my view, as a major organizer of science Andrey Nikolayevich stands right after the "father of Russian aviation" N. Ye. Zhukovskiy and his pupil S. A. Chaplygin. It was largely thanks to Tupolev's efforts that a powerful scientific research and experimental base for aviation was created in the country, and the new Central Aerohydrodynamics Institute above all.

Andrey Nikolayevich Tupolev would arrive, stride vigorously into the office and there was unquenchable optimism and strength in his entire appearance. Probably what struck me most in him specifically was this unfading vitality of his no matter how circumstances shaped up for him and no matter what occurred in his destiny, and it was not always favorable to him. Sometimes being in a very difficult position and working under difficult conditions, Tupolev successfully directed a large collective and always continued to be an optimist. He was able to create a good mood in himself and others. Andrey Nikolayevich would drop in on me in such a way that seemingly he had just arrived in the people's commissariat from home after dinner. He dressed simply in a *tolstovka* of unbleached material. The conversation would begin and he immediately would crack some joke, break out laughing, and laughter immediately would fill the entire office. He alone was able to laugh that way.

I had occasion to meet with Tupolev more than just in the office. I also observed him at the airfield. He behaved there as the boss, as a real chief designer. Great willpower was required to continue work successfully and carry it on at such tempos, for a chief designer who does not at times place strict demands on people is no longer a chief designer. He will not be able to make a machine quickly. At that time Tupolev was creating a front dive-bomber, the well-known Tu-2, which took part in combat actions basically during World War II and gave an excellent account of itself.

Andrey Nikolayevich Tupolev was given the assignment to design this bomber in the spring of 1940, and as early as fall of that year they built it and in January 1941 tested it. A bomber is not a fighter. It is a more complicated combat machine and, if it can be thus expressed, more "labor-intensive." Tupolev nursed his new offspring literally day and night and when everyone was resting he was always doing something, at times completing a particular part with his own hands. And if people would look at him from one side it would seem that this was one of the many workers building the aircraft. Tupolev differed little from them outwardly.

Here is curious proof. Once A. N. Kotikov, chief of the bomber aviation department of the Directorate of the Air Force, who was a member of the model commission, saw Tupolev at a model of the aircraft. Kotikov had been appointed to that position recently and didn't know Andrey Nikolayevich by sight. Later he would recall:

"On arriving at the TsAGI [Central Aerohydrodynamics Institute] I spent a long time examining this plywood Tu-2 aircraft, which had been made with surprising

thoroughness and strictly conformed to the design in its external configurations. In viewing it from all sides and comparing it with the design data I came more and more to the conclusion that this would be a superb bomber and it was necessary to speed up its production.

"As a pilot I also was interested in equipment of the pilot's cockpit--arrangement of instruments, convenience of flying, field of view and so on. I sat down in the cockpit and began to study everything in succession. A worker sitting on the aircraft's left surface was doing something silently with the fuel tank filler and would look at me with curiosity in the middle of what he was doing. Initially I also somehow automatically gave him attention, but later forgot about him, caught up by what I was doing.

"After completing my study of the aircraft and writing down comments in a notebook, I emerged from the cockpit and once again inspected the entire aircraft while standing on the surface.

"Well, what do you think?' the worker asked me with audacious curiosity.

"Leaving his work, he sat there and looked at me as he awaited an answer.

"Engaged in my own thoughts, I didn't answer him and was about to get down, but he persistently repeated:

"How about the aircraft, did you like it?"

"I was surprised at his persistence:

"You're asking about the aircraft? I think it's not..."

"Huh!" he uttered in dissatisfaction and then remarked: "'Not" is an empty word, but this is a future aircraft and it has to have something good.'

"And he quickly descended.

"When commission members assembled the chairman asked us to report our conclusions on the aircraft. In examining those present I again caught sight of this 'worker' sitting to one side and, listening to our remarks carefully, making notes on his pad. When everyone had reported the commission chairman, turning to him, asked:

"Andrey Nikolayevich, do you have any remarks concerning the commission members' conclusions?"

"Only after this did I realize that this was the designer of the Tu-2 aircraft, A. N. Tupolev."

Vladimir Mikhaylovich Myasishchev produced a strong impression. He began to engage in designing back when he was a student and immediately drew the attention of Tupolev, under whose direction he later worked for several years. Vladimir Mikhaylovich had occasion to take part in creating heavy bombers, and

they became the primary work in his life. A talented engineer, he took over a design bureau on the eve of the war.

Vladimir Mikhaylovich was a person of somewhat different stamp than Tupolev. Outwardly rather dry and reserved, he didn't opt for intimacy until he felt sincerity, warmth and a humane attitude. He also was restrained in his conversation. Little diverted by any kind of nonofficial affairs or side issues, Myasishchev answered only questions in substance and so it seemed that he was wholly absorbed by the thought with which he had come. The following contact with him did not dispel my initial impression, but even reinforced it. That is how I recall Vladimir Mikhaylovich: strict and restrained. But I saw more than once that despite his external dryness he skillfully directed a large collective.

Myasishchev built the first high-altitude bomber in the world with pressurized cockpit and fitted it with remote control on the eve of the war. He did what the Americans managed to do only in the course of the war. It is true that they began to produce series aircraft with pressurized cockpits before us, but we outstripped them in creating this design. The machine had high tactical flying characteristics, but Myasishchev's aircraft did not go into production in part because Tupolev's bomber, which was simpler and no less powerful, appeared simultaneously. Myasishchev's aircraft was ahead of its time. Vladimir Mikhaylovich received the State Prize for creating this promising bomber which embodied ideas on which subsequently the development of high-altitude, high-speed aircraft largely was based.

During the war years Myasishchev did much to create transport aircraft and, after the death of V. M. Petlyakov, to improve the Pe-2 aircraft, our primary divebomber. Myasishchev worked as the chief designer at a series-production plant producing these aircraft.

Vladimir Mikhaylovich Petlyakov was the third of the designers who created bombers. On the threshold of the war he was in charge of a KB at an experimental designs plant. Petlyakov was almost the same age as Tupolev, and he also had occasion to work under Tupolev's direction. Long before the war Vladimir Mikhaylovich participated in creating bombers, one of which was used for special purposes as a mother ship. Before the war Petlyakov created the well-known Pe-2 bomber. This was a two-motor, three-place aircraft which considerably exceeded all previous aircraft of this type in speed and fundamentally differed from them in its equipment.

An engineer on a major scale, Vladimir Mikhaylovich was a sincere and simple person. When the decision was made to revise the high-altitude fighter he designed, which already had been built and tested, as a divebomber, Petlyakov put his whole heart into the assignment. He moved to the plant, became a part of the collective's life and gave much help in placing the aircraft into series production.

A Pe-2 regiment passed over Red Square in Moscow for the first time during the May Day Parade of 1941. Bringing up the rear of the air parade also was a flight of "Petlyakov's," which passed over the Kremlin at enormous speed at an altitude of only 100-150 m and produced a strong impression on everyone assembled here at that time.

But Petlyakov died in an air crash in early January 1942 while flying from the plant to Moscow. Vladimir Mikhaylovich Petlaykov's death was a serious loss.

My story about the creators of combat machines would be incomplete if I did not mention Nikolay Nikolayevich Polikarpov, the founder of the designing of Soviet fighter aircraft. For many years he was the primary designer to create combat machines of this type. For the mid-1930's the machines were world class and initially they fought successfully in the sky of Spain as well as in Mongolia and China. Even before the war Polikarpov created a very promising new fighter with exceptionally high technical and tactical flying qualities, as well as a number of other aircraft, but they did not enter series production by virtue of a number of reasons not related to the designer.

Nevertheless Polikarpov's fighters took part in the Great Patriotic War, especially in its first period, since they made up the basis of Soviet fighter aviation. In a number of instances Soviet pilots fought successfully in them against fascist fighters, not to mention bombers. Pilots who fought the enemy in fighters designed by N. N. Polikarpov received the first titles of Hero of the Soviet Union and the first guards titles. One of Nikolay Nikolayevich's aircraft fought the entire war. This was the U-2, a training aircraft designated the Po-2 following the death of Polikarpov in 1944. All pilots loved it for its simplicity and tenacity of life. Then the Po-2 was converted into a light night bomber from a training aircraft and an aircraft which before the war was widely used in agriculture and forestry, for aerial photography, for communications and for medical transportation.

In late 1941, when the plants rebased to the east still had not begun operation and the industry was not able to produce the necessary quantity of aviation products, the decision was made to mobilize the country's entire aircraft inventory. All aircraft, including obsolete makes, were taken and transferred for combat purposes from staffs, rear units, aviation schools, Osoaviakhim [Society for Assistance to Defense and Aviation-Chemical Industry] air clubs, and from the Civil Air Fleet. In November 1941 the State Defense Committee decreed that air regiments be activated from these aircraft for night actions. That marked the beginning of the night light-engine bomber aviation--NLBA, the proportion of which rose quickly in the Air Force at that time.

The U-2, which had no equal in the world in longevity, held a special place in this aircraft inventory. The first U-2's were produced in 1927, but even at that time the machine laid no claim to high flight data. The Germans saw this aircraft in 1928 at the air exhibition in Berlin, but they couldn't get it into their heads that this plywood and fabric machine, the speed of which reached a maximum of 150 km/hr, might present any kind of danger for them in the future. On seeing the U-2 at the front the Hitlerites initially laughed and dubbed the homely aircraft with contemptuous nicknames such as "coffee-grinder," "Russian plywood" and so on. But the small, slow aircraft proved to be a superb night bomber, especially under conditions of close contact with the enemy. At Stalingrad for example where there was fighting for every block, house and story and where bombers of conventional types could not operate the U-2 would drop bombs without a miss not only on a particular house, but even in separate apartments occupied by the enemy.

I had occasion to come in contact with Nikolay Nikolayevich Polikarpov rather often in the prewar and wartime period to the very last days of his life. Despite his being known worldwide, he was extremely modest. I never met another such person in my life. Nikolay Nikolayevich even stood out in his modesty among our youth--designers who at this time were making their first machines. He always spoke quietly and would fold his hands together downward in a somehow special way. If I had to give him a negative answer he would agree quietly:

"Fine, fine."

But he wouldn't leave and would begin again to justify a particular request, also tactfully but persistently. He always was invariably the same whether the talk was about expanding the plant, increasing the staff of designers, beefing up the machine tool inventory or performing some kind of tests in TsAGI or in the test flight institute. At the same time Polikarpov's exceptional working capacity, precision and discipline were striking. He was very diligent in executing decisions made on his aircraft.

Sergey Vladimirovich Il'yushin at this time was designing a completely new machine--he was the designer of the ground attack aircraft. His aircraft was intended for operations in the zone near the front, in close coordination with the infantry, and above all against the ground enemy including enemy tanks. Even earlier, during World War I and after it attempts were made to create an aircraft which could fly near the ground, support friendly forces and deliver strikes against the enemy. Our country also tried to make a ground attack aircraft, but not one of the designs proved successful enough for the goal to be achieved. Frankly speaking, Il'yushin's ground attack aircraft was not accepted by everyone: Both disapproving and cautious voices were heard. Great efforts were required to change the attitude toward this aircraft.

Il'yushin's design feat merits high esteem. Several years before the war began Sergey Vladimirovich was assigned as chief of the Main Administration of the Aviation Industry. Some time later he tried to return to design work, but did not succeed. Then Il'yushin wrote a letter to Stalin.

"Since you were appointed, you must work," Stalin said during the meeting with Sergey Vladimirovich. "You are not an incidental person, but a highly trained one. If you leave, others will leave and who will be in these posts?"

Before Il'yushin's eyes Stalin tossed his petition in the wastebasket.

But still Il'yushin had his way. He turned in his request in writing once more, and this time it was given attention: "With the present depth of defense and organization of the troops and their enormous firepower (which will be directed at ground attack aircraft), ground attack aviation will suffer very heavy losses," wrote S. V. Il'yushin. "Our types of ground attack aircraft, both those in series production . . . and experimental . . . have great vulnerability since not one vital part of these aircraft--the crew, engine, lubrication system, fuel system and bombs--is protected. This can heavily degrade the offensive capabilities of our ground attack aviation.

"Therefore the need has matured today to create an armored ground attack aircraft or, in other words, a flying tank in which all vital parts are armored.

"Realizing the need for such an aircraft, I worked for several months to solve this difficult problem and the result was a design of an armored ground attack aircraft...

"I request you release me from the position as chief of the main administration in order to carry out this outstanding experiment which will improve immeasurably the offensive capabilities of our ground attack aviation, making it capable of delivering crushing attacks on the enemy without losses or with very few losses on its part...

"The task of creating an armored ground attack aircraft is exceptionally difficult and fraught with great technical risk, but I will take up this matter with enthusiasm and full confidence in success."

The aircraft passed plant testing and then state testing. The pilot who tested it described this machine as follows: "Against the background of experimental fighters, my aircraft did not stand out as the latest model--too cumbersome and clumsy, with a thick wing, on sturdy, widely placed undercarriage legs and with a sharp steel nose like the head of a shell. This was the Il-2, its one-seater version. The cockpit was armored with thick glass and steel and looked humped. . . . How could I, still a young test pilot, assume that this aircraft would become a legendary airborne soldier at fronts of the Patriotic War, to which only one month remained?"

If we had made aircraft and not engines, we hardly would have had occasion to tell now about our aviation's advantages over German aviation. Just as a person can't live or move without a heart, so an aircraft can't live or move without an engine. Motor mechanics sometimes joke that if an engine were placed on a gate, it too would fly. There is a portion of truth in this. The engine gives an aircraft life and to make the engine is even more difficult than the aircraft. Under ordinary conditions an aircraft is created in 2-3 years and an engine in 5-7 years or even more. By the beginning of the war we had engines which conceded nothing to the best foreign models and in many respects even surpassed them. We are obligated for this to their creators--designers, scientists and plant collectives, who provided our fighter, ground attack and bomber aviation with modern engines. As the future showed, the war which began became a war of engines.

I would meet with all chief aviation engine designers, visit them in the bureaus and travel to engine building plants. Everywhere I saw exceptional enthusiasm, creative initiative and a desire to cope with the tasks set by the party and government no matter what--to provide the new aircraft being built with engines of appropriate horsepower and reliability.

Vladimir Yakovlevich Klimov, already well known by that time, was a talented engine designer. At one time having taken the French water-cooled Hispano-Suiza engine as a basis, Klimov achieved results which this firm itself was not able to attain. Vladimir Yakovlevich can be said to have created a new

engine. As he himself joked, the copy he developed proved better than the original. His engine was twice as powerful and made "finer" so to speak; it did not lose in strength and reliability and had a long operating life. Klimov's engines were installed in the Yakovlev fighters and Petlyakov bombers.

Arkadiy Dmitriyevich Shvetsov, whose name also is well known, designed air-cooled engines which before the war were customarily seen in Polikarpov's fighters. Arkadiy Dmitriyevich can be said to have stood at the origins of Soviet aviation engine building. The first air-cooled radial engine he designed, the M-11, with only 100 hp, broke all records of longevity, serving training and light-engine aviation to this day. The slow-moving U-2 aircraft, which became a light night bomber, performed combat assignments with the M-11 engine.

By the time in question Arkadiy Dmitriyevich had designed several other air-cooled engines.

Lavochkin's aircraft, which surpassed the German Messerschmitts and Focke-Wulfs in the aggregate of combat qualities, became the primary consumers of Shvetsov's engine in the war. By the way, the Focke-Wulfs also had an air-cooled engine. While valuing many of the air-cooled engine's merits, the pilots especially loved it for reliability. When one, two or even three cylinders would go out in combat the engine would continue to operate and it was possible to reach the nearest airfield on it. In addition, in contrast to water-cooled engines, these engines with their wider "forehead" reliably protected the pilot against enemy fire. Despite heavy drag the Shvetsov engine permitted Lavochkin's aircraft to develop speeds which conceded nothing to the speeds of other fighters and even to surpass them.

Aleksandr Aleksandrovich Mikulin, the third aviation engine designer of this cohort, also was a gifted engineer. His AM-34 engine, later the AM-35 and right before the war the AM-38 were made firmly and had enviable strength. Future prospects for their improvement were apparent. With the creation of engines of Mikulin's design Soviet aviation received great opportunities for long flights which conquered the world. The flight to the United States of America across the North Pole was made in aircraft with engines created in Mikulin's KB.

These engines were installed in heavy bombers, in Mikoyan's fighters and in Il'yushin's ground attack aircraft. The successes of A. A. Mikulin's design bureau were natural. Aleksandr Aleksandrovich took his first steps together with the first steps of Soviet engine building. Even before World War I he was working at a plant which was trying to build the first aviation engine. "Here, beginning as fitter and molder and ending as assistant chief of the assembly section," recalled Mikulin, "and working 12 hours a day, I went through the stern school of production worker and realized the value of human labor." Contact with prominent designers and scientists and participation in creating the first aerodynamics laboratory of N. Ye. Zhukovskiy in Russia, at the Moscow Higher Technical School, gave Aleksandr Aleksandrovich a great deal. Later many capable designers and even major scientists worked in A. A. Mikulin's KB, which unquestionably had an effect on the improvement in qualities of the engine he designed.

There was one other design bureau which was headed before the war and during the war by a very capable engineer, Yevgeniy Vasil'yevich Urmin. This design bureau continued to work on a series of engines, the M-88, M-89 and M-90, which were intended above all for long-range bomber aviation. The series-produced M-88 engine of various modifications was one of the four aviation engines on which our aviation fought. A. S. Nazarov and S. K. Tumanskiy, who headed the design bureau before Ye. V. Urmin, made a great contribution to designing those engines.

Yevgeniy Vasil'yevich was advanced to the position of chief designer of the Zaporozhye Plant in the fall of 1940 when we realized that this KB had to be reinforced. Urmin was working at the Central Aviation Engine Building Institute and already had considerable experience in designing engines. Yevgeniy Vasil'yevich was distinguished by originality of engineering thought, an ability to have a delicate feeling for problem areas in engines being made, and a great art of taking a job begun to the end. Urmin had a good knowledge of the engines produced by the plant. He quickly delved into defects and found their roots, and the M-88 engine, which had been removed from production, began to be produced again. This was the response to a message addressed to the plant director and chief designer: "No one needs the M-87 engine. If you really want to help the country and the Red Army, support production of M-88 engines..." In July 1941, a bit earlier than the deadline, the M-89 engine also underwent state tests, already under fire of the bombings which had begun, since the Zaporozhye Plant was within the enemy aviation's zone of action.

Urmin's KB, evacuated to the east, continued experimental work under difficult conditions and achieved considerable successes in creating powerful air-cooled engines, but the existing situation did not permit using them operationally. The M-88 remained the primary series engine. With it the Il'yushin bombers delivered bombing strikes against short-range and long-range enemy rear areas.

The creation of new types of fighters and bombers also required new propellers, radiators, landing wheels, instruments and so on without which an aircraft will not fly far. Although simply named, these aircraft parts represented rather complex mechanisms which demanded much work and effort on the part of designers and collectives of the appropriate plants to ensure that all this "suited" the new aircraft and served them reliably.

I recall an incident which was related to me. After one flight in a long-range bomber a well-known pilot came to see the chief designer and, entering his office, literally pounded his fist on the desk:

"How long will we drag water barrels on the aircraft?"

It turned out that the radiators installed in the aircraft sometimes leaked in flight and the pilots were forced to take along water barrels and add to the system during flight. When an examination was made substantial design defects were seen: The radiators were riveted and water would seep out from vibration at the riveting location. The defect was remedied. They shifted to welding radiators and at the same time improved them, which freed pilots of the need to carry along water in some cases.

This is only a small feature but on the whole reorganization touched all aviation production down to the last rivet, figuratively speaking.

For example, what instruments were needed now? Those which allowed flying in any weather conditions, at any time of day or night. They were created. An artificial horizon appeared--an instrument which determined the aircraft's attitude in the air relative to the ground at a given terrain location. New altimeters, speed indicators and compasses appeared. The creation of automatic pilots is a special service of instrument making. With their help it was possible to see the aircraft's location at every segment of time on a plotting board with a map. Before this computations were made on navigation slide rules.

I wish to emphasize that on the threshold of war the country had everything necessary to produce its own sophisticated and precise instruments without which the construction of a modern combat air force is inconceivable.

A few years before the beginning of war Sergo Ordzhonikidze visited one of the oldest instrument making plants. He was shown the production of gyroscopic instruments, artificial horizons, directional compasses and much more then produced by the plant. When the rounds of the plant were over Ordzhonikidze asked:

"Are these instruments more accurate than a clock?"

He heard in response:

"Comrade People's Commissar, our instruments perhaps are not more accurate than clocks, but they still are rather precise. Most important, they do not at all operate under those conditions in which clocks function. For example, they are subjected to such vibration loads that clocks would not withstand, and the temperature is quite different."

"This is fine that your instruments are precise and reliable," said Ordzhonikidze. "But how many of them do you produce?"

He was given the number.

"Could you put out twice as much?"

"Yes, Comrade People's Commissar."

"And four times as much?"

"Yes, Comrade People's Commissar."

"And ten times?"

"We can't, Comrade People's Commissar. For this it would be necessary to expand production areas twofold or threefold and train twice or three times as many skilled workers. Then we will put out ten times more instruments."

"And if a conveyor is organized?"

"This can't be done today. The selection of bearings is piece by piece for us now, and each instrument must be adjusted individually. A second conveyor--rejects--may come off that conveyor."

"That's your task," Ordzhonikidze told plant workers in parting. "Instruments must be manufactured on a conveyor."

By the beginning of the war such a conveyor had been created at the plant.

I would like to note the heightened role of aviation science in this extremely responsible and difficult period. Special emphasis must be placed on services of the Central Aerohydrodynamics Institute, which had a new complex built by late 1940. The largest scientific research center where aircraft aerodynamics were tested, where aircraft were tested for strength and where static and other tests were conducted was outfitted with the most up-to-date equipment. High speed laboratories and an enormous wind tunnel which permitted a full-scale "blowing past" of aircraft at subsonic and transonic speeds represented an exceptional value. It was from these tunnels, figuratively speaking, that our aviation flew in 1940, the aviation which routed fascist aircraft and won full air supremacy during the war.

I remember that in late 1940 we showed the new TsAGI to K. Ye. Voroshilov, at that time deputy chairman of the Sovnarkom and chairman of the Defense Committee of the USSR SNK [Council of People's Commissars]. When he went up on the roof of the large full-scale tunnel he was astounded and exclaimed:

"This is taller than the Sovnarkom building in Okhotnyy ryad!"

At that time this was the tallest building in Moscow.

A stunning panorama of the entire scientific compound, comparable in scale with the present Novosibirsk Akademgorodok, opened up from the roof of the full-scale tunnel. Everything at the new Central Aerohydrodynamics Institute was surprising: grandioseness of structures, the modern nature of equipment and the perfection of many technical solutions. The country's industrial might could be seen in everything. And how could one help but be astounded on seeing an enormous bomber being placed on the wind tunnel balance for a test?

Academician S. A. Khristianovich, who worked at TsAGI both before the war and during the war, said it well when he became deputy chief of this Institute: "Everything takes time, and in science perhaps most of all because from scientific research to the end result, i.e., to the moment when this end result flies, shoots and works, it takes time. And so when we speak about what scientists did during the war one must speak above all about how our science was prepared for the war. During the war there was chiefly realization of what was prepared before the war. During the war we laid down our future in aviation, i.e., we accomplished an essentially new task of creating jet aviation, which provided the power of the Air Force after the war."

During January-February 1940 we already were able to conduct ground testing of new aircraft: We developed power plants, fired weapons at the range, and did much more. With the arrival of spring in early March we began flying. The pilots were assigned ahead of time to machines being built and so became familiar with features of their design, weapons and equipment in advance, which allowed accelerating the tests. A great deal was done for this at that time. Plants would assign special night teams which would quickly fix troubles identified during daytime flights. These same teams also worked during the day. Practically everything was done around the clock--people would replace each other only for rest.

I came to many tests together with Yakov Vladimirovich Smushkevich and the Air Force chief engineer Aleksandr Konstantinovich Repin. Yakov Vladimirovich would understand the pilots with hardly a word spoken when they returned from a flight and reported the aircraft's behavior in the air. The test pilot would remember much that instruments were not able to record: what happens with the aircraft in the air, what difficulties arise for a pilot in control, in performing particular figures and so on. The discussion would begin after the pilot barely took off his interphone headset. The chief designer and chief engineer took part in the discussion. There was a straightforward dialogue in the presence of Air Force and aviation industry leaders. The necessary instructions followed immediately if necessary.

The party Central Committee would demand reports from us about progress in testing a particular machine: about the first sortie, the pilots' first impressions, subsequent flights, and all difficulties which occur during testing. It was made the duty for me personally and the Air Force chief to give an account of this each day. After some time official daily summaries were introduced about the progress of all testing.

I recall an instance which served as a major lesson for me and for many workers of the people's commissariat, attuning us to a very businesslike manner in everything. This occurred soon after I was appointed people's commissar. I was called in by Stalin and was heaped with reproaches from the threshold, as they say, as soon as I entered the office, and in a very sharp tone: Why, why, why? Why did such-and-such events happen at such-and-such plant? Why is this behind? Why isn't such-and-such being done? And many more various "why's". I was so taken aback that I barely said:

"Comrade Stalin, you perhaps have lost sight of the fact that I have been in this position only a few days?"

And I heard in response:

"No, no, no... I didn't lose sight of anything. Perhaps you will order me to demand an account of the person who was in this work before you? Or that I wait another year or half-year? Or even a month? For these deficiencies to occur? That I don't touch anyone? Of whom must I demand an accounting about what is being done wrong in the aviation industry and at the wrong tempo?"

Having been quite astounded at first by this discussion, after some reflection I realized that only in this way of course could a party leader accomplish the

tasks then facing the country. Stalin not only wanted to demand an accounting of me, he wanted me to demand an accounting of others in the same way--exactly and sharply, and for me to take a very firm approach to matters which the aviation industry then was accomplishing.

Soon we saw that if the tests were to be conducted as we did it, with multiple repetition of one and the same stages both at the plant and at the Air Force Scientific Test Institute, i.e., repeat the daytime and nighttime flights, the aircraft strength test, weapons test, range firing and so on and so on, then the allotted time would not be sufficient for us. We would be late. We wouldn't eliminate the lag as quickly as was needed. The fact is, if we conducted tests under the "old" arrangement, then the check of just the weapons alone--firing them at the range, bombing sorties, the launch of rocket projectiles--would require several months. Then a suggestion arose to hold all tests together. Following the plant pilot this same aircraft would be flown by the military test pilot, then followed joint discussions, joint decisions, and joint evaluations and conclusions. In the final account we received an extremely important gain in time.

I would like to emphasize in particular the role of the Air Force Scientific Test Institute and its chief, Brigade Engineer Aleksandr Ivanovich Filin, a very vivid figure in our flying world. Filin's name received a reputation for the first time in 1934 when together with M. M. Gromov and I. T. Spirin he set a world record for flight distance over a closed curve in the ANT-25 aircraft--the aircraft flew more than 12,000 km. But of enormously greater importance for our aviation was the test flying activities of the collective of the institute headed by A. I. Filin and his personal flights in new aircraft.

Filin was one of the first engineer-pilots in the country, which was extremely important at that time when we were creating new equipment. Such a combination now--pilot and engineer--surprises no one. Many rank-and-file pilots of line units in our days are pilot-engineers. At that time this was rare. Engineer titles were especially needed by pilots who tested fighters. While it was possible to place a flight engineer, senior project engineer and mechanics aboard a bomber, there was one and only one person aboard a fighter and that's all: He was the pilot, the engineer and the scientific worker. For this reason Aleksandr Ivanovich's high competency in everything connected with testing aircraft was extremely valuable in selecting them, in determining the best for being placed in series production, and in determining prospects and evaluating particular innovations for the future development of aviation.

Having engineering knowledge and being a master of flying, A. I. Filin would fly each aircraft himself before placing his signature beneath the "Approved" on the test document.

In that spring of 1940 an experimental aircraft with a tricycle landing gear, i.e., it had also a nose wheel in addition to the conventional wheels, was undergoing testing. This was one of the first, if not the first "three wheeler" in our country. The opinions of pilots who tested the aircraft diverged. Some accepted and some didn't accept the new type of landing gear. Filin flew in the "three wheeler." After making several take-offs and landings, Aleksandr Ivanovich immediately esteemed the innovation. It is

superfluous to say how sagacious this proved: Almost all modern aviation, including supersonic, has the type of undercarriage with nose wheel.

We soon began to realize that the new, much more complicated equipment and each new aircraft posed so many questions that the test pilots and designers alone could not resolve them on their own. Moreover they were working only on their own machines, hoping that specifically their aircraft would enter series production, but we had to compare and select the best objectively and impartially. A test flight center was necessary which would provide authoritative conclusions and recommendations for designers and plants, identify the best aircraft, monitor the conformity of series combat machines to test models, and determine particular qualities of an aircraft right while it was being created.

We went to the government in early 1940 with this proposal to create a Flight Research Institute. Our proposal was not only immediately accepted, but the deadlines planned for setting up such an institute were reduced considerably. Appointed as its chief was the well-known pilot Hero of the Soviet Union Mikhail Mikhaylovich Gromov, who set many flight distance and altitude records. He had a reputation in the flying world as a person who possessed high flight culture.

I had several meetings with Gromov, but I recall one in particular. Mikhail Mikhaylovich flew into the Flight Test Institute in an aircraft. It seemed to me he saved little time, but on the other hand took an unnecessary risk. I asked that it be passed on to him that he, as everyone else, ride to work in a vehicle. After a little while Gromov came to me on this matter.

I remarked that although he was an experienced pilot, an aircraft nevertheless was not an automobile and there was more risk in flight.

"I understand," responded Mikhail Mikhaylovich, "but I am reporting to you, Aleksey Ivanovich, with all sincerity, and I can write this officially, that nothing will ever happen to me in flight."

I objected:

"Why are you so sure? Accidents happen even with very experienced pilots."

"Here's the difference," explained Gromov willingly. "No matter how much I fly or how much experience I gain I always treat an aircraft on a formal basis. Under no circumstances do I forget what a pilot has to do before getting into an aircraft and during the flight. I have wonderful mechanics whom I have known a long while, but I still always inspect everything thoroughly myself, before the take-off I check readiness and when I get into the aircraft I wipe my feet."

I firmly remember Gromov's words: "I wipe my feet before I get into the aircraft." They characterized him very accurately as a person who did nothing by chance. During his long flying biography Mikhail Mikhaylovich did not make a single serious mistake. As a matter of fact nothing ever happened to him.

One could synchronize a watch on Mikhail Mikhaylovich. I don't remember him being late anywhere. He would ride or fly in to the minute. At the same time he was a creative person and kept an eye on everything concerning aviation.

Once I was told that Gromov was requesting permission to purchase a herd of sheep for the Institute airfield. When I asked why he wanted sheep at the airfield and that in my opinion they would only hinder and could lead to accidents, Mikhail Mikhaylovich responded:

"The sheep naturally won't be on the airfield during flights, but when the flights end the sheep will go onto the airfield and with their hooves will make its grass cover such that there won't be any dust. The flying field will be ideal."

He had read this in some foreign journal and, as things turned out, he was right.

Well-known scientist Aleksandr Vasil'yevich Chesalov, who had worked in this Institute for many years, became Gromov's deputy for science. He made a great contribution to research of aircraft before the war, in wartime and later. Aleksandr Vasil'yevich did everything, I would say, with great expression, very assertively, and this corresponded in no better way to the point in time than being experienced. Everything being done in the Institute had to be introduced to the combat machines immediately and introduced to production. Other comrades whom I recall with great respect also worked at the Flight Research Institute of the aviation industry. They brought our LII [Flight Research Institute] deserved fame. This establishment now has numerous comprehensive laboratories, test beds and much more.

At this very time we concluded that we needed one other research institute for aircraft equipment in which new apparatus and new instruments would be created and tested and recommendations given to designers and plants.

By the fall of 1940 we succeeded in selecting the best from the many aircraft models, making them operational and placing them in series production. We chose the aircraft of Lavochkin, Mikoyan, Yakovlev, Il'yushin, Tupolev and Petlyakov. The war showed that our choice was correct.

To Be Continued

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## GROUND FORCES

### TANK REGIMENT'S SHOWING AT SUMMER TRAINING CRITICIZED

Moscow KRASNAYA ZVEZDA in Russian 24 Jul 83 p 2

[Article by KRASNAYA ZVEZDA correspondent Maj A. Ladin: "No Changes as Yet"]

[Text] In the winter training period personnel of the tank regiment to be discussed did not fulfill their pledges. An integrated staff commission of the Central Asian Military District working here directed particular attention to deficiencies in the personnel's technical training as well as to the fact that some appointed persons do not show proper concern for improving conditions of equipment upkeep or the quality of its servicing. This was one of the reasons for nonfulfillment of pledges.

The second month of the summer training period is ending. What changes have occurred in the regiment?

The first facts, which lay on the surface as they say, were pleasantly gratifying. The regimental commander told about them. It turned out that the regiment's subunits which participated in a past tactical exercise coped with their assigned missions successfully. What is important is that the equipment taken to the range functioned faultlessly. It would appear that people in the regiment learned lessons from past shortcomings...

But let's not be hasty with conclusions. Let's take a closer look at the real state of affairs.

The servicing of tanks and other vehicles began in a number of subunits immediately on arriving from the exercise. At the suggestion of Capt A. Chuprun, chief of the regiment's armored service, specialized teams outfitted with all necessary instruments and tools were set up from among the best trained specialists of repair and other subunits. These groups followed the timetable in beginning welding operations, checking adjustments and parameters of instruments and components, calibrating sights and so on. A lubrication station began operation and this permitted reducing the losses of valuable oil products to a minimum. Competition began for quality fulfillment of the day's assignment by each crew.

The regimental commander explained that they chose this direction of competition with consideration of previous mistakes. The fact is that previously

they had hastened to drive the tanks into the bays as quickly as possible, with the winners of such a "marathon" being announced. But after awhile the inspectors rebuked the "winners" for an unconscientious attitude toward equipment servicing.

Well the new approach to evaluating competition results in equipment servicing meets today's requirements. As it was learned later, however, having chosen the proper direction in competition the regiment showed no concern to see that it took in all subunits and all personnel. Questions of moral incentives for those who distinguished themselves and of the generalization and dissemination of the leaders' experience remained by the wayside for the deputy regimental commander for political affairs as well as the party committee secretary. At the same time it was simply necessary to support the tankmen with a friendly word and persuasive example. Along with the fact that each of them had to perform a large amount of work, all basic operations of tank servicing had to be done in the scorching sun when the temperature even in the shade was over 35 degrees. There was a limited amount of water both for drinking and for technical needs.

But it was as if this had been forgotten. Party activists wanted to post a motto with an inspiring appeal but for some reason they didn't. The mobile reading rooms remained in the barracks and the regiment's political workers and party activists themselves unfortunately kept as far away from the motor pool as possible.

By the way, a great deal of formalism in competition also was discovered in winter quarters. The reading room of the subunit where Officer Yu. Chepusov is deputy commander for political affairs to this day is decorated by last year's pledges of the tankmen to raise class ratings. A majority of people listed were released to the reserve in spring. Pledges made for the summer training period have not been formalized and there are no arrangements for summing up competition results by established deadlines.

The integrated commission discovered an especially large number of deficiencies at the end of the winter training period in two of the regiment's subunits--a combat engineer subunit commanded by Sr Lt V. Kaminskiy, and a chemical defense subunit commanded by Lt I. Morozov. There was a natural desire to learn what conclusions the officers and their subordinates had drawn for themselves and whether or not their attitude toward the equipment had changed.

These subunits' vehicles are located in the farthest corner of the regiment's motor pool in the last rows. While work was in full swing at parking areas nearer the KTP [technical control point], no movement was observed for days on end here to one side. It is true that once I found Pvt K. Abishev from the 2d Tank Company at one engineer vehicle unscrewing suitable bolts for his own tank. In justifying his actions the soldier pointed to the prime mover he had chosen:

"It seemed to me that it is no one's. You see what an unkempt appearance the vehicle has, and the combat engineers are rarely in the motor pool..."

Of course the absence of the prime mover's owners in the motor pool did not at all give Pvt Abishev the right to do what he was doing, but the soldier was right in one thing--the vehicle's appearance really forced one to think that it had not been assigned to anyone for a long while. By the way, the chemical personnel also had such unserviced vehicles. This was wheeled equipment for the greater part. After inspecting it I recalled a conversation with Maj V. Sannikov, chief of the regiment's motor vehicle service. To the question of why, as the regulation requires, he did not check the technical condition of vehicles on prescribed dates the officer responded confidently that the equipment was in order and there was no need for this. But a check showed a different picture. It turns out that this officer too did not draw conclusions from the last inspection.

Why? Perhaps because on attending a party committee session once, he left there only slightly ashamed. The comrades shook their heads reproachfully: That's not good, Vladimir Fedorovich. But no one was about to delve into the essence of shortcomings of which Sannikov had a large number. This reassured him.

I began to search out the combat engineers and chemical personnel. If they were not in the motor pool, then where were they? I received an answer from Capt Mishchenko in the headquarters: on TDY, at a course. I checked and yes, in fact two soldiers headed by Capt A. Kornev, chief of the regiment's chemical service, were on TDY. And where were the rest?

Finally I succeeded in finding traces both of the officers and their subordinates. It turned out that through their efforts, applied far from the unit, curbing had been obtained to improve the external appearance of the military post's central avenue, and they say that soon other materials also will begin arriving here...

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## GROUND FORCES

### TANK PERSONNEL REMAIN STRANDED WITHOUT HELP FOR THREE DAYS

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 20 Jul 83 p 4

[Article by KOMSOMOL'SKAYA PRAVDA special correspondent Capt V. Saydakov, Unit "X": "Service Day by Day: Hold on, 42d!: A Combat Vehicle Crew was Cut Off from the Column by a Slide High in the Mountains During an Exercise and Help was Long in Coming..."]

[Text] A tank's armor and the crew's proficiency shelter it in combat. For this reason there are more than enough exhausting marches, moving target gunnery ranges rutted until they pain the liver, and explosive kilometers of attacks in a tankman's Army life.

But a tank is strong in combat also by the crew's courage and teamwork. Concealed by armor alone, the tankmen share victories and defeats equally. Over a two-year distance many tests of strength fall to the tankmen's lot and at times chance provides an assessment of their courage.

Tank commander Sgt Aleksandr Maynulov: "This was a unique incident which will be long remembered in the unit. More than one generation of tankmen will be indoctrinated by a political officer telling this story. But the Army teaches us to be ready for anything unexpected."

Gunner Pvt Roman Bekhmetov: "Somewhere around the third day I had doubt as to whether or not help would come. Did they suddenly forget about us in the turmoil of the exercise? Here there were only mountains roundabout, with neither water nor bread. Later I became ashamed of this thought."

Tank driver-mechanic Pvt Yusif Aslanov: "I blamed myself more than anyone. It is inexcusable for a mechanic to evaluate a breakdown incorrectly. But the lads kept reassuring me that such a breakdown happens once in a hundred years. I don't agree--I should have noticed. The fact is, I'm not simply a driver-mechanic, I'm a soldier. A soldier."

"Devil take these mountains," swore Maynulov good-naturedly. "You don't know whether or not it's winter or summer here."

The commander straightened up and glanced at Yusif and Roman. Their faces were red and damp. They also were pounding the rocky soil without particular enthusiasm. He wondered just who had gotten this happy thought of digging a caponier for the tank in the rocks.

Dinner was approaching but it was outstripped by a command:

"Mount! Start up!"

"There it is," Romka even grunted out of annoyance. "We grubbed out this pit, and for nothing."

"CQ! This is Bronya-1!" came the commander's voice over the interphone headsets. "We're making a march. Shifting to an alternate area. Stop on command. Into a march column..."

After about seven kilometers their engine died.

"Did you fall asleep?" Sgt Maynulov's voice rang over the intercom. "Start up!"

As soon as Yusif put it in gear the engine uttered a roar and the steel claws of the track links pulled the rocky strip of road toward themselves, but the engine died. Again and again the mechanic put it in gear but to no avail. The column began to go around the helpless tank.

"Bronya-1! This is 42d," Maynulov called up the platoon commander. "We have ceased moving, the engine stopped."

Soon a tank braked to a stop near them. Sr Lt Letnev listened to the sergeant's report.

"Can you cope yourselves? How much time do you need?"

Everyone looked at the driver-mechanic. Yusif estimated something in his mind and reported:

"In my opinion the fuel pump is fouled. About two hours' work."

The lads brightened up. That meant the exercise would continue and they would be in formation.

"That means," said the platoon commander tracing a line, "here's the map, Maynulov. This is our route. We'll make two stops en route so take your time catching up. Stay in communication with me all the while. That's it."

And they were left alone among the mountains. They could hear for some time yet how the column was clambering up the rocks, but soon the noise abated and it became very quiet.

"I think we'll begin..."

"With dinner, commander," said Romka interrupting the sergeant. "They soon will take a halt for a hot meal. And when will we have another chance to have a bite?"

The arguments were persuasive and they ate quickly and silently. The time hurried them on. It was only when they were sharing water from the canteen that Romka just could not refrain.

"And if we were stuck this way for a month? Without food and without water, eh?"

"We would be satiated with your tongue," joked Maynulov and ordered: "Now to work."

While Yusif fussed with the engine they inspected the running gear. From time to time the sergeant would come up in communication with the commander. Audibility was so-so: Either the column was moving away quickly or the mountains were interfering.

Then Aslanov started the engine. Romka already was making like a brass band, but the tank just did not move an inch. Yusif stuck his head out of the hatch with a grayish face and lips that had been bitten.

"Lads! Sasha... Comrade Sergeant, this is not the pump. It's something different."

The commander rushed to the radio: "Bronya-1! Bronya-1! This is 42d!" He leaped to the ground and swore maliciously.

"That's it, no communications." Later he added, this time quietly: "That means we'll spend the night here. Never mind, we'll get out of this. We'll await technical help."

It froze that night. There could be no thought of sleeping. They spent the time restlessly until dawn, half-lying, half-sitting. In the morning Maynulov suddenly commanded:

"Out for physical exercise!"

"Here it comes," said a gloomy Romka with astonishment. "Who are you, the commander?" And he inspected the sergeant with feigned cordiality.

But the sergeant was implacable and the three of them made circles around their fortress. When they had warmed up Maynulov said:

"No one knows how long we will be here, but we'll observe the routine. Here's today's plan: You Roman take care of the wood. And you Yusif try to persuade that hunk of iron. I'll also try to conjure up communications. Perhaps something will come up."

They never thought a day could last so long. With each passing hour they wanted to have a drink more and more. The mountains clung to the clouds and conscientiously shook them, but in vain: Not a drop fell to the ground.

Romka came back after around three hours and he leaned his back against the vehicle wearily:

"There are only rocks around. Probably only tanks grow here. How about you?"

The lads were silent.

"Now you Roman stand watch at the set and I'll have a look in another direction."

Maynulov returned late and also without wood.

At midnight they suddenly heard the roar of an engine and they leaped outside. They shouted and whistled. It was pitch-black roundabout. Aslanov was first to realize what it was:

"That's a plane, lads, you see it there?"

They raised their heads and red dots of hope melted away in the sky.

"It's a pity that I'm not a pilot," sighed Romka. "I'd help you lads. I'd at least toss out a piece of bread."

Later they admitted that the third day was the most difficult. Even in the morning Maynulov sensed that his head was spinning a bit. Without "replenishment" it was not even a joy down below, and here after all there were mountains. Roma noticed this immediately:

"Today I'll conduct the physical exercise. Only let's do it without the crosscountry, for some reason my leg aches."

The sergeant smiled at this guile of Romka's.

Later Yusif burst out.

"It's all my fault. I let you down. I alone am at fault for everything."

"Stop it," said the sergeant, interrupting him. "What do you mean you? There are three of us and we have faith in you. You'll still find the trouble, Yusif."

Aslanov did not answer for a long while, then he struck his fist on the armor.

"I'll find it!"

"That's the ticket," smiled Romka. "I personally don't believe that this scrap metal is stronger than us."

Yusif dived into the hatch.

"Listen, Sasha," Romka studiously hid his eyes, "what if they forgot about us? You know the exercise is going on and there's such a commotion..."

"What are you saying, Bekhmetov?" asked the sergeant, and he even leaped to his feet: "Who forgot us? Letnev?!"

Romka was embarrassed:

"I only meant... Something came over me. By the way, I read somewhere that in time the feeling of hunger becomes dull. On what, I wonder, the gizzard? They're lying!"

They heard the noise of an engine toward the end of the third day and thought it was again an aircraft, but the sound did not disappear.

"Lads, it can't be a hallucination." Romka had a blank look.

But Yusif began jumping in place:

"I swear that's a ZIL. It's a ZIL or you can cut off my ears."

They ran, gulping the rarefied air and it seemed their hearts would leap outside at any moment. "I have a beating right under my tongue," complained Romka. They slowed to a walk.

It wasn't a military vehicle.

"God Himself sent you to me, men," said the driver happily. "Can you give us a push?"

They did.

"Thanks, men! And how about you? Are you fighting here? You wouldn't happen to have anything to eat? I forgot the grub and haven't eaten anything since yesterday."

"They bombed the kitchen," said Romka with a wave.

The path to the tank seemed an eternity.

That night Romka concocted a "stove." He tossed a rag with solar oil into a bucket and lit it but the "stove" smoked more than it heated.

Company first sergeant WO Movsesyan located them on the fourth day. Sent by Letnev to help, he had gotten into a slide along the road. While the path was being cleared he had tried to locate the 42d on the air until he was hoarse.

"And when I got there I was even a bit frightened," said the warrant officer, frowning in recalling this scene. "They jumped out laughing, emaciated and black. They were squeezing Aslanov's hands and trying to swing him. They dropped the poor devil as there was no strength. It turns out Yusif did find the trouble. By the way, it is almost impossible to detect it under field conditions but when we brought the vehicle into the motor pool the 'diagnosis' was confirmed."

I had a long talk with the lads, but didn't ask the main question. But in parting Yusif said:

"I know you wanted to ask whether or not I could answer the platoon commander at that time that we wouldn't cope. For then they would have left technical assistance. But the column needed it and the exercise had just begun..."

Platoon commander Sr Lt Letnev: "Aslanov is a rated mechanic and so I left them with a light heart, but the next day I sent out help. Then came the slide... The lads held out magnificently. One can only be proud of such people."

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## AIR MARSHAL YEFIMOV ON AIR FLEET DAY

LD250333 Moscow in Polish to Poland 1300 GMT 20 Aug 83

[Speech by First Deputy Commander in Chief of the Soviet Air Forces Air Marshal Aleksandr Yefimov; date and place not specified--recorded in Russian with superimposed Polish translation]

[Excerpts] On 21 August the Soviet Nation and the armed forces solemnly celebrate the day of the air fleet of the Soviet Union.

The present international situation is tense and complex. The increased authority of the Soviet Union and the other countries of socialist community--triumphs of the forces of peace, democracy and social progress--clearly do not suit reactionary capitalist circles and, above all, American imperialism. Under the cover of myths about the Soviet military threat, imperialist reaction attempts to change the strategic military equilibrium which exists in the world to their own advantage. Imperialist reaction once again wagers on a policy of strength. They encourage an arms race and prepare themselves for the new war. At present, Washington is plotting to annihilate socialism as a system. In these circumstances, the Soviet Union and other countries of socialist community are doing everything possible to defend peace.

We shall increase the military potential of the Soviet Armed Forces, which is a powerful factor for stopping aggressive moves by imperialist reaction. This concern finds its expression in increased operational contributions from the Soviet Air Forces. [sentence as heard]. Their pilots persistently develop masterly skills on new planes, mastery in air battles, accuracy in air raids and rocket attacks.

The main combat force of the Soviet Air Force, and the air forces of the countries of the socialist community are planes and helicopters equipped with most modern weapons, unfailing means of detecting the enemy and directing fire. Technical equipment makes it possible for the Soviet Air Force to decide independently and together with other forces on large-scale operational and strategic tasks, both in land and sea theaters of military operations. This is fully in accordance with the need for unfailing air defense of the socialist countries.

I want to stress that the brotherhood in arms of brotherly armies, born in battles against Hitlerite fascism, is constantly being improved; it is developing constantly. This was proved in the joint exercises involving commands and staffs of allied armies and fleets--Soyuz 83. These exercises were held in the GDR, Poland, Czechoslovakia and in the southern part of the Baltic Sea.

The Soviet Union is assisting the socialist countries in the training of flying personnel and other specialists of their air fleets. Internationalist cooperation in space exploration continues to grow. Soviet cosmonauts together with their colleagues from Czechoslovakia, Poland, the GDR, Bulgaria, Hungary, Vietnam, Cuba, Mongolia and Romania went into space.

Celebrating their holiday, the day of the air fleet of the Soviet Union, the Soviet pilots become even more aware of their personal responsibility for performing their patriotic and internationalist duties, they are improving their combat readiness. They are always ready to defend the air space of their homeland and of the brotherly socialist countries.

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AIR DEFENSE FORCES

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NAVAL FORCES

LIFE ONBOARD NUCLEAR-POWERED SUBMARINE

Moscow LITERATURNAYA GAZETA in Russian 27 Jul 83 p 12

[Article by Aleksandr Prokhanov, Northern Fleet, July 1983: "Ascend to Periscope Depth--Report from Onboard a Nuclear-Powered Submarine"]

[Text] The submarines lie along the piers, black and sprawling. It is as though the armor is an extension of the granite rocks, secluded in the stony bosom of the gloomy northern base and veiled in the earth's icy breath.

The berthing party in their orange jackets run along the narrow deck, from the steep promontory to the resilient stern with its protruding fin-like rudder. The submarine utters a weak sigh and separates from the concrete, increasing the strip of dark water.

I stand inside the conning tower, gripping the wet, stinging metal with my hand. I can see the admiral's shoulder beneath the wooly flap of his jacket. I can see the commander's weather-beaten face and on the distant mountains, the sharp tips of missiles guarding the base.

The nuclear-powered submarine is departing for the exercise area. Enveloped by the wind and haze and the screams of seagulls darting by, it leaves the bay, powerfully and noiselessly, shoving aside the ocean water with its round steel head, excavating a smooth pit in the water, leaving a sloping white wake. It moves through the boundless, phantom-like glow of the polar waters.

"Full speed ahead"!

And the blind, superhuman power embodied in the giant moves it powerfully forward, hefting up the ocean, flinging brilliant black cascades against the hull and leaving a roiled, thrashing trail behind the stern.

The exercise director is still a young admiral, whose work on the submarine consists in unobtrusively and subtly observing the multifaceted actions of the crew involved in the exercise. What is he thinking just now? The commander and navigator are briefed enroute to the area "cut out" for the nuclear-powered submarine. A detachment of surface ships will enter the area. The submarine will remain concealed for a time and then rush into the attack, striking with torpedoes. The admiral makes a casual, relaxed comment to a sailor at his battle station among the valves, levers and buttons, and the latter, elated by the admiral's words, blushed softly.

As he stands there in the swiftly moving steel shell, perhaps he is thinking about his native village in the Arkhangelsk area. He spent his childhood there. His father left his grandfather's home there, with its carved cornices, and gave his life at Lake Ladoga. His mother died of a broken heart from her loss there. He recalls the cries of the widowed in the houses. Perhaps he is recalling the biscuits made of orach, the hard work enthusiastically performed by the old people and the children and on Victory Day, the fraternal table set along the street, the invalids with their medals, his orphanage in the midst of songs and accordian music....

He was enrolled in a Nakhimov school, perhaps because there was always the smell of the sea in the Arkhangelsk woods. Peasants from there became good sailors. They exchanged the plow for the helm of a ship, left the forest glades covered with cranberries and gooseberries for life on a ship's deck.

He joined the Northern Fleet as a young lieutenant, after the glorious age of the diesel-powered submarines, which had fought in the polar region, which remembered attacks in the fjords, the burning German transports and duels with the "junkers," which retained the echo of depth charges in their tired hulls. He had sailed on those submarines, eagerly listening to the veterans of the Great Patriotic War and the news of new, unprecedented designs which would appear in the fleet at any time.

The postwar fatigue and pain ended and faded into remoteness. The nation gave a new sigh, free and powerful. It flew into space. It developed the Virgin Lands. It greeted the Cuban revolution. It built atomic electric power plants....

Then an enormous submarine of unprecedented shape surfaced swiftly and silently in the bay. It moored here in the North, and the era of the nuclear-powered submarine began. He was amazed and thrilled, timid but wanting to touch the steel body in the water. Nuclear subs joined the fleet, assuming the glorious traditions of the diesel-powered submarines which operated in the Great Patriotic War, their behests, as it were, parts of their memory. An awesome new weapon was born, which altered the nature of ocean warfare and left a new and fierce imprint on the world.

There were the first cruises into the World Ocean, into the strange topography of distant oceans and seas. The submariners overcame their shore mentality, acquired a sense of space, the ability to perform enormous maneuvers in the ocean, independence of their base, of their native refuge on shore. They pinned their hopes on the burning boiler of a reactor, which moved the submarine in the boundless abyss, where the likely enemy, experienced and accustomed to dominating, descended into the depths, where the enemy's ships cruised. The enemy's supremacy in the World Ocean was shaken by the appearance of Soviet nuclear-powered submarines. Our defense gained a powerful new border extended out to sea.

There were the first cruises into the Arctic, beneath the ice, beneath the polar icecap, when the human soul pined, compressed into the numerous shells of steel, submarine hull, countless tons of water and a vault of polar ice. And the emergings at the pole, when the glistening black hulk parted the white armor, tossed aside the reverberating ice floes with its iron hull and tore its way to the

surface. And the crew rejoiced, breathing in the silvery vapor, and the staff holding the red flag pierced the polar air.

The submarine designs changed. The fleet received submarines carrying a nuclear load in enormous containers, which glided elusively among the underwater ridges and currents, highly mobile and invulnerable to the "enemy." Today's nuclear-powered submarines, so enormous and powerful that they recall underwater communities, trace their origin back to those prototypes....

Changing ships and crews and acquiring a knowledge of the machinery and combat techniques, the admiral is overseeing a never-ending job, that of shielding with the conning tower our croplands, our cities, our cradles....

The submarine is a narrow, elongated vessel divided up by bulkheads with round, tight hatches, ready to instantly seal off, to plug up the compartment, to cut it off from everything around it. One plunges through an iron ring, leaving an area filled with panels and instruments, only to end up in another one just like it. A series of similar, twinkling, humming spaces, dimly illuminated, pipes intersecting and joining. A sailor stands at a station there, surrounded by levers and valves. It is as though the supple figure is a part of the overhanging vault, is holding it up, supporting the frame with his shoulder.

Here is the reactor room. A grilled metal floor. The invisible, walled-in, silently operating reactor, which gives the submarine its motive power, its air, heat and light. Wearing black, perforated sandals, the submariner's footwear, it seems as though I can feel through my feet an extremely hot, radiant substance beneath me. This is an illusion, however. The reactor area is sealed off, walled in by a thick protective shell. Only individual parts can be seen through the transparent quartz: white steel, snow-white sheaths--the atmosphere of a sterile operating room....

Seaman Viktor Zaychenko is the damage control specialist on duty. The crew calls him "Zaychik." A personal dosimeter hangs from the buttonhole of his overalls. His hands are on the controls. His eyes follow the arrow on the indicator. A machine operator, he is familiar with the breathing and the rhythms of the radioactive heart. He works in constant contact with it and directs its unseeing life, obedient to his will.

He is the son of peasants from the Ukrainian village of Lebedovka, which is near Kamenka in Cherkassy Oblast. A submariner, emersed in the military work, in the complicated nuclear engineering profession, he remains true to the steppe, to his hut there. When his service is completed he will return to his peaceful fields, to his peaceful ancient work. He is of the country. But here he is among the weapons and nuclear equipment. He will fulfill his duty to the homeland, serve out his term--and return to raise the grain.

It was not easy for him, a farmboy, to assume this post here in the smoothly humming, dimly lighted compartment.

He is accustomed to an endless horizon, a spacious sky, the fragrant wind in the blossoming grainfields. It was hard for him to get used to the sealed shell in

which every centimeter is accounted for, where the sky is a close metal vault, where the wind is artificially recovered oxygen pouring out of the recycling devices, and instead of the sounds of steppe birds, the charged pulses of commands and orders constantly pass through the submarine.

He is accustomed to dealing with damp garden beds, with roosters and cows, and here he has been placed right next to a reactor. He was awed by its roasting heat at first, until he became convinced that it was absolutely safe and took control of it.

A favorite, the pet in his home, surrounded by attention from his family, his teachers and neighbors, who overlooked his pranks, he was sent on a long cruise, where the rigid external rules imposed upon the crew by the work is combined with an inner spiritual state of constant self-control, self-restriction, which demands everything the youthful, untempered will and ethics have to give.

The long isolated cruise consists of monotonous days and weeks under the water, broken up not by the time of day or the changing of the calendar, but only by the rhythm of the watches.

The vigor and the enthusiasm of the first days at sea are gradually replaced by an unexpected sadness and alarm. Now the submariner has to look for reserves of fresh strength and optimism inside himself. He has to inspire himself and to inspire a comrade who has given himself over to despondency. He has to "bring out," to outline over and over in his mind, the mission which has brought him here to the ocean depths.

Two of his village buddies, with whom he graduated from school, are also in the service--one in our Group of Forces in the GDR, another in Afghanistan. A third is extracting oil near Surgut. They grew up in the same village but are now dispersed in different parts of the world, serving a common cause. They hold up the mantle of peace, guard the state with the kind of protection which has been the lot of their generation at the end of the 20th century.

He celebrated his 19th birthday deep under the water, standing watch. When his watch ended he was summoned to the ward-room, where the commander shook his hand. The cook brought in a pie baked in the abyss and with his name written on it. His friends presented him with a sailor's skivvy shirt decorated with a drawing of their own submarine and wished him a happy birthday.

Standing there near the reactor, among the white lights reflecting off the stainless steel, adjusting his dosimeter, he admitted to me that he had recently dreamed of sunflowers, of his mother walking along a path and a girl's face....

"Practice alert! Dive! Descend to 150 meters"!

"Aye, aye, sir! Descending to 150 meters"!

The submarine draws in the antenna and the periscope. It takes in two enormous gulps of water. Heavy ocean brine splashes over the forward Kingston valves and the prow sinks beneath the water. Achieving trim, the submarine starts to descend obliquely into the depth, bearing increasing pressure from the water on

its hull. One's ears are stopped up slightly, and the floor begins to sink beneath one's feet like an express elevator. Together with the instruments one's heart feels the giant submerging, the enlargement of the multiton vault. The submarine levels off, loses its list and proceeds at the prescribed depth, boring through the ocean and washed by powerful underwater currents.

Here is the sonarman's battle station. A screen with an orange, jittery line traced by a fiery dot. In the head of the submarine hydrophones listen through a sound-passing diaphragm to the streaming, sound-filled mass and transmit to the interior of the submarine a sonic picture of the multidimensional ocean spaces.

Lieutenant Sergey Kadatskiy, the sonarman wearing the headphone, follows the electronic blip and translates the crackling and rustling of the "underwater ether" into information on the situation. During a long cruise people come here to this small area of the submarine, crammed with instruments, simply to look at the screen, to listen to the rustling in the earphone, in order to sense the outside world from the sealed-off space, to have some sort of contact with it. Combat information also flows from the sonarmen there and is stored in the brains of the torpedoes.

Hearing is the lieutenant's main tool in his underwater work. "Perfect hearing," capable of distinguishing the finest subtleties of differences among the noises and from these subtleties "to correctly guess" which is the target, to untangle the complex sonic skeins in the underwater orchestra, to interpret the sea's sonic picture. He can tell the type of ship from the murmur of its propellers-- a cruiser, an aircraft carrier, a frigate, an Ohio or Lafayette submarine. I put on a headphone and listen to the singing of the ocean. This is the sound of plankton, a living, ringing cloud through which the submarine is passing. Now I hear the vibrations from a school of fish. This is the sound of some killer whales rushing toward the ship, playing with it and calling to it. They take it for a whale.

The young lieutenant recognizes all of these sounds. In the cacophony of the ocean, however, he is listening for those sounds, the only important ones, for which he has come on the cruise. He is listening for the murmur and pounding of those propellers, uniformly calm and even, which hide the rumble and roar of disaster prepared to strike. He is listening for the voices of hostile submarines which have aimed their megatons toward our borders. To him, the sonarman, the possible scream of world war three takes the form of sonic vibrations borne in the wake of submarines.

A Leningrader, here in the ocean, far from his native home, he is protecting his Hermitage, his Avrora, the house where he was born. He is protecting Moscow, the villages of the Caucasus, the irrigation ditches of Turkestan. Moscow's defense today does not pass through Volokolamsk or Klin, or even through Brest or Vyborg. In today's global struggle the defense lines girdle the continents.

When, during his first isolated cruise, his earphone first "copied the sound" of an American nuclear-powered submarine crammed with Tridents, gliding through the water near him, he followed it and tried to imagine: Could there actually be

somewhere nearby, beyond a layer of water, people prepared to burn his homeland, to doom it to agony and death? Is it possible that such people could also have children and mothers who saw them off on the cruise with kisses and gave them lucky charms, people whose submarine, when it left the warfs of Bremerton, carried on the cruise punched cards with the Urals, the Ukraine and Siberia named as targets?

His initial youthful bewilderment passed. He knows that the military strategists of the USA are not simply trying to frighten us with their power. They are prepared to put it into action. They openly state this in their aggressive doctrines.

He listens to the World Ocean, trying to pick up the signals of trouble. He is listening to an awesome era, vacillating on a balanced, fragile axis. Its spirit and will are preventing it from losing that balance.

The forward compartment, the torpedo room.... I place my palm against the cold casing and sense through the steel the silent wave of the ocean penetrating through the brine filling the tunnel. Snow-white torpedoe tubes with red stars on the ends. A torpedo will hurl itself from them with a blast of compressed air, detect the target with its "all-hearing ear" and lock on, catch and pierce the target, turning into a fiery, exploding ball.

Nazim Sentbekirov and Valeriy Konev are two friends, both warrant officers and torpedomen. Their bunks are located here, next to the long torpedoes with their sheathed heads. In the night they can reach out and touch the cold, burnished hulls. In case of an alert, they can be out of their beds in an instant, standing at the firing keys on the torpedo launchers. They carefully tend these awesome tubes, and it seems to me that there is something more in their contacts than the simple fulfillment of instructions on the care of the equipment. The weapons are a means of combat, a means of destroying the enemy, of protecting the submarine against enemy attacks. And they are a means of rescue--these cylinders provide an exit to the outside, to the world. Behind the torpedo tube on the iron casing I notice a small child's drawing--a little house, a path and a girl.

The submariner has a mind which can be compared with no other, a unique mentality embracing the most diverse temperments and natures. Something in common unites them into an amazing "submarine fraternity."

In peaceful, "civilian" life every individual who feels like a complete, worthwhile human being seeks critical, extreme situations, attempts to test himself--his mind, his spirit and his body--at the critical, borderlines. It may be in sports. It may be in the conquering of mountain peaks. Or even in racing a motor vehicle at high speeds. Simply by submerging, the submariner subjects himself to an extreme situation. It may be an ordinary exercise, but he is performing in the realm of great tensions and risks.

Back on land we frequently discuss the problems of man's alienation from the equipment, man's alienation from the group. These discussions, perfectly valid for us, mean nothing to the submariner. For him the equipment is a means of

breathing, of seeing, of functioning intelligently, of rescue. It is not a question of functioning with or without the equipment. It can only be with. The team, the combat crew, is a natural, smoothly organized union of people, in which egoism, ambition, a sense of superiority over another are impossible. The individual sacrifices himself for the sake of fraternity, and the underwater fraternity guards the individual's life with its selfless work. The submarine crew is itself an individual, woven of numerous lives and fates.

In the cities, in apartments with all the conveniences, with assured industrially provided services, people are isolated from the elements, from primordial matter, from global, always brutal, superhuman forces. It is just the opposite for the submariner. He acts and thinks in terms of poles, magnetic fields, tsunamis, powerful currents sweeping the world. In the submariner the relic sense of nature, dulled by civilization, is awakened and moves into the realm of real alarms and concerns encoded in the readings of the numerous cunning instruments supporting his vital activities. A submariner knows the planet as it was back in the stone age, as it still is, although slightly disguised by civilization.

Sometimes in our very difficult, at times agonizing, "land" life, we look for some sort of extraordinary impressions to invigorate us. New amusements and values, an entire entertainment industry. After living for months between confining metal, in the midst of alert bells and alarms, the submariner, upon coming ashore, sometimes rejoices naively and with exaltation. He delights in the air, the sight of a tree, the cry of a bird, nature, art, a woman.... This impressiveness and sensitivity to primary values is such that if one plays a tape with the voice of his mother or wife during a cruise--this is sometimes done by the deputy commander for political affairs--a veteran submariner, taken by surprise, may even burst into tears.

And naturally, face to face with danger, the submariner is charged with the highest degree of responsibility for the fate of the homeland and of Earth. A patriot, politician and military man, he expresses his outlook on the world in physical action, in the performance of his naval duties.

Leonid Bondarenko, a young officer, is the second-in-command on the submarine. His father was a submariner and spent many years at this rocky northern base, where the decumbent tundra birches barely manage to put out leaves by mid-June, and where the polar wind sweeps stones through the village in the winter. His son, also a submariner, grew up on this base. When he went to school the children would link themselves together, five in a bunch, and cling to the lamp posts a long time, waiting for the gusts of blizzard winds to pass. He grew up, and he did not choose to enter a different field, to go to a different, sunny, hospitable part of the country. He stayed here, in this rocky fjord, where the officers' wives wear motorcycle goggles and hockey masks in the winter to protect their eyes against the snowstorms, sharp as broken glass, where they complain that they are going to have to straighten up their posture before spring, after walking around bent over all winter in the face of the storms. His twin brothers are completing submariners school. As the senior member, he has already taken them on board the submarine and given them lessons in real submarine work. They too have found nothing better than to continue this "sitting on the rocks," from where

there is no direct road to the center--it is almost a 24-hour trip by sea--and flowers for a special occasion are a marvel discussed by the entire garrison. How did they become attached to these black boulders, on which the snow does not thaw all summer long?

Because a city, small and compact, has arisen here on these boulders. It was built by the efforts of three generations of Northern Fleet sailors. Spread out, imbedded, over the savage slopes are five-storey apartment buildings with electricity and bathrooms. A stable and important center of life for these parts, to which each individual has contributed his bit and continues to do so. This is their own native abode, already their homeplace. A winter garden with chirping parakeets. A monument to a lost submarine. A greenhouse, where vegetables are ripening. A monument to submariners....

The climate here is a harsh one, there is no denying that. Relations among the people are amazingly warm and sincere, however. Overlooking ranks and titles, they are friendly people. They respond to a call for help and they get together on festive occasions. When the young lieutenants arrive from the Big Country and their young wives look fearfully at the tundra, the old-time families "spread them" among their apartments and surround them with concern and warmth. They keep them in their apartments for months, until the newcomers can set up their own homes. One cannot be mean here in the midst of this mean nature. Kindness is also a way of combatting the elements here.

And then of course there is the occupation, service aboard these sullen vessels, hardened beneath the pale skies. There comes another, far beyond the cape, whipping up the foaming sea as it moves, the heavy hull has traveled through the depths of two oceans. Women and children run to the pier to greet their beloved ones, and those black nuclear-powered submarines seem close to them and wonderful.

This place, on the edge of the earth, is also part of the homeland. It is their home.

"Sonarman to Central Control! I have a target! Bearing 110 degrees! A multiple target! Tentatively identified as a group of cruisers...."

"Practice alert! Ascend to periscope depth! Periscope up!"

The glistening periscope rises, extrudes into the air. Captain 1st Rank Vyacheslav Ivanovich Afonin, commander of the submarine, twirls the control, presses his eyes against the optical instrument, sprints in place and turns nimbly, like a boxer in a stance.

A group of combat ships--a nuclear-powered cruiser and escort vessels--are moving by overhead, on the surface, their propellers rhythmically slicing through the water. The submarine has waited for them in the assigned area. It will now attack them. It will launch dummy torpedoes, driving them past the bottom of the ship. The crew has merged into a single sinew, poised for action and primed for battle. The commander is the agent of the collective will.

He is the son of military people. His mother and father fought in the Patriotic War together, in the same tank. He has made seven isolated cruises at the present time, has traveled under the ice and to the Atlantic. He has studied the submarine's capabilities, discerned the engineering concept embodied in it and discovered new capabilities unknown even to its designers. He has evaded ASW submarines, taking part in complex movements and maneuvers in which the submarines try to outwit and outdo each other, to escape the "acoustical field of vision." The ocean is the arena of a struggle between underwater giants stalking each other.

How would we describe the art of the submarine commander participating in the modern global strategy! The ocean in which he functions, in which he directs the crew entrusted to him, is scanned acoustically and visually. He has to take his submarine, unnoticed, through a chain of enemy hydrophones set up on the bottom and "listening" for a submarine. Information from these systems flows through underwater cables to information centers on shore, and if they fix the submarine's position ASW aircraft will fly to the area of detection and drop buoys with hydrophones, "surround" the submarine and guide ships to it.

His art must include the ability to evade Orion reconnaissance aircraft.

And he devotes all of his art as a mariner, all of his art as a sailor, to the struggle. He believes that when the struggle is over, when mankind has crossed this awesome period which has befallen the end of the century and the danger of war is removed, all of the knowledge acquired by the submariners about the ocean will help with the development of the ocean depths so essential to mankind. And underwater communities will be built with the aid of this knowledge, no longer with military application, and underwater teams will be created for extracting the ocean's riches.

"Target number three! Aircraft!"

"Crash dive!"

The submarine smoothly and instantly conceals itself from airborne radar. It glides through the water and approaches the ships, selecting the attack course. The commander, the admiral, the torpedomen and the seamen in the reactor compartment are turned into a single entity by the living electricity running through the submarine, building up momentum for the attack.

"Torpedo attack against surfact target! Torpedo tubes, stand by!"

Far off somewhere a head of grain is cut and falls, a brick is added to a wall, a baby is born. There is blessed peace in the homeland. But here in the frigid polar waters a submarine is beginning an attack.

"Fire torpedoes!..."

The torpedoes leave the submarine, begin pursuit and overtake the ship. The first awesome and powerful torpedo slips out, and then a second. Now they are beneath the cruiser's keel. The instruments fix their point of contact with the target.

The nuclear-powered submarine alters its course and leaves the attack area. The tension falls. It is as though a wave of unseen energy has rolled through the submarine and entered the ocean with the torpedoes. The commands die down. A tape recording "cuts into" the ship's intercom system. "Along Piterskaya...."

The personnel, grown pale and restrained, listen from their battle stations.

The submarine is returning to base.

11499

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## NAVAL FORCES

### VICE ADM ALIKOV ON NAVY DAY

Vilnius SOVETSKAYA LITVA in Russian 29 Jul 83 p 2

[Article by Vice Adm I. Alikov, member of military council, chief of political directorate of Twice-Honored Red Banner Baltic Fleet: "31 July--USSR Navy Day: Ocean Strength of the Power"]

[Text] The Soviet people will celebrate USSR Navy Day on 31 July. This year this traditional holiday is especially noteworthy as it is being celebrated in an atmosphere of high political and labor enthusiasm caused by resolutions of the June 1983 CPSU Central Committee Plenum and the 8th Session of the USSR Supreme Soviet, 10th Convocation, and by preparations for the 80th anniversary of the 2d RSDRP [Russian Social Democratic Labor Party] Congress.

Our Navy has a grand history. V. I. Lenin and the party of Bolsheviks attached great importance to using the energy and revolutionary enthusiasm of navymen in the struggle for the power of the Soviets. By October 1917 naval Bolshevik organizations represented one of the most spirited party detachments. They numbered up to 16,000 persons. The Bolshevik layer among seamen was an average of 11 percent.

Armed defense of the young Soviet republic became a vital necessity in the first days of existence of the workers' power in our country. Lenin took an immediate part in preparing the Decree creating the Red Fleet, and he made changes in the introductory part of this document which reveal its purpose and missions.

In the time between the Civil and Great Patriotic wars the Soviet people under Communist Party leadership successfully accomplished an enormous amount of work to strengthen our maritime borders. The Baltic and Black Sea fleets were restored and represented a well-organized fighting force. The Caspian and Amur flotillas and detachments of military vessels on the Dnepr and Western Dvina were successfully revived. By party and government decision naval forces were created in the Far East, as was the Northern Flotilla, and these later became the Pacific and Northern fleets respectively. Technical reconstruction of old combatants and construction of new ones was accomplished successfully.

The navymen met the Hitlerites' surprise attack in an organized fashion and subsequently shifted to resolute combat actions. They reliably assured the

strategic stability of maritime flanks of the enormous front, effectively aided in defeating the fascist German groupings by weapons from the sea and by landing assault forces, and they conducted independent operations successfully. During the Great Patriotic War a total of over 1,300 combat and auxiliary ships and 1,400 enemy transports were destroyed. Naval aviation flew some 400,000 combat sorties. In August 1941 Baltic aviators delivered the first bombing attacks against the fascist capital of Berlin.

Practically immediately after World War II ended reactionary circles of imperialist states, where the United States held a leading position, began to prepare for new "crusades" against the USSR. Under these conditions the CPSU Central Committee and Soviet government were forced to take steps to ensure national security. One of these steps was creation of a qualitatively new ocean-going, nuclear missile navy meeting all demands of modern warfare, which concentrates in it the latest achievements of those fields of science and technology, development of which now determines scientific-technical progress.

But no matter how formidable and sophisticated the arms are, they do not decide the matter of themselves. The main strength of the fleet is the people in whose hands the formidable combat equipment rests. Responding to the concern of the party and people and deeply realizing their responsibility, Soviet navymen are bearing the baton of naval glory and valor with honor. They have proven more than once that they are up to any mission.

Admirals and officers, warrant officers [michmany], petty officers and seamen learn military expertise on long deployments and cruises, in drills, exercises and maneuvers, all the while striving to take most effective advantage of combat training. That is how the ability to fight a strong, well armed enemy is acquired.

There is no greater sense of responsibility for them than responsibility for the safety of our country's maritime borders. Their allegiance to the great Lenin's behests and devotion to the Communist Party is embodied in faultless service to the Motherland.

In keeping up with the leaders the Baltic navymen also are heading with confident steps toward new goals of combat perfection. Like all the Soviet people and all Army and Navy personnel, they fervently and unanimously approve and support the Leninist course of their native party and see their patriotic and international duty as standing vigilantly on guard over socialism's achievements and always being ready to offer a crushing rebuff to any aggressor.

The Baltic navymen demonstrated this readiness to the full extent during the "Soyuz-83" joint command and staff exercise. Operating shoulder to shoulder with brothers in class, the navymen of the GDR NVMF [People's Navy] and the PNR VMF [Polish People's Republic Navy], personnel of the DKBF [Twice-Honored Red Banner Baltic Fleet] demonstrated outstanding combat schooling and teamwork, high tactical and weapons proficiency, and an ability to hit targets with the first missiles, torpedoes or salvos. There were many who distinguished themselves in those days in performing difficult and responsible operational training missions.

Crews of the submarine "Ul'yanovskiy Komsomolets" and of the guided-missile patrol boat "Kirovskiy Komsomolets" and the collective of Fleet aviators where Officer A. Rukovitsyn serves are the right-flankers of socialist competition for a worthy celebration of the 80th anniversary of the 2d RSDRP Congress.

Our Navy is a multinational combat collective. Emissaries of Soviet Lithuania perform the difficult naval duty together with representatives of all fraternal union republics. Things are going well for the crew of the ship "Komsomolets Litvy." The members of this military collective who are representatives of the republic--Officer V. Terechka, Petty Officer 2d Class Yu. Vasyaris, Sr Smn P. Vaytkus, Smn V. Vidugiris and many others--worthily fulfill the behests of their fathers and mothers.

Party and soviet entities of Lithuania give invaluable assistance to the command element in accomplishing the difficult missions facing the Twice-Honored Red Banner Baltic Fleet. Sponsorship ties of Baltic Fleet personnel with toilers of the Nyamunas area are constantly growing and strengthening. This helps bring up high-principled, reliable defenders of the Motherland.

Leaders of the Communist Party and republic government and of the Komsomol Central Committee visit the ships and units and give us assistance. We highly value this and are sincerely grateful.

Prominent figures of science, culture and the arts, creative collectives and Komsomol workers often visit the Fleet. Such mutual ties enrich the Fleet's ideological life and we will do everything necessary to strengthen this traditional friendship.

In preparing a worthy greeting for our holiday, USSR Navy Day, Baltic Fleet navymen are working with enthusiasm in the strenuous days of summer combat training. They are steadfastly perfecting combat proficiency and schooling in exercises, drills and ocean deployments and are bending a maximum of effort to fulfill with honor the party's behest of being in high combat readiness.

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NAVAL FORCES

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LOGISTICAL SERVICES AND SPECIAL TROOPS

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PERCEPTIONS, VIEWS, COMMENTS

VOLKOGONOV COMMENTS ON THE NEUTRON BOMB

Moscow SEL'SKAYA GAZETA in Russian 5 Aug 83 p 3

[Article by Lt Gen Dm. Volkogonov, doctor of philosophical sciences, professor: "An Expert Opinion: Again the Neutron Bomb?"; passages rendered in all capital letters printed in boldface in source]

[Text] APN--People have not forgotten that two years ago, on 6 August 1981, the American administration decided on a large-scale series production of the neutron bomb. This was done defiantly on the day of the 36th anniversary of the barbaric atomic bombing of Hiroshima. The profound political cynicism of this step showed exceptionally starkly the distorted thinking of Washington's leaders who are wooing "world leadership" or, more simply, world domination.

And then again two years later the White House and the Pentagon publicly return to the idea not simply of "perfecting" the genocide weapon, but also the idea of attempts to station it in Europe. The West German WESTFAELISCHE RUNDSCHAU writes in an article entitled "Weapons for Europe" in the 14 July issue: "Again they still are imposing on us that which several years ago caused indignant protests throughout Western Europe. We are speaking of the neutron bomb. American strategists, it seems, do not wish to wait for their allies to agree voluntarily to accept this weapon on their territory. The choice apparently again has fallen first of all on the FRG." The STUTTGARTER ZEITUNG informs its readers in turn that the American Senate again is shoving through the idea of stationing the neutron bomb in Europe "without regard for its allies." The priests of "neutron humanism" again are trying to accomplish what they failed in doing previously.

Someone in the Pentagon, believing that the stationing of Pershing-2 and cruise missiles in NATO countries is something that has been decided and actually already placed on a technical footing, is hastening and accelerating events. Today the Pershings, tomorrow neutron weapons, the day after tomorrow chemical binary shells, and then something else more frightening. Europe is one of the great cradles of human civilization. Having become a hostage of the United States it is full of all kinds of deadly weapons. In case NATO unleashes a war these weapons naturally will become a target for a retaliatory strike. It doesn't have to be explained what will happen in this case with the territory of those countries which agreed to station nuclear and neutron weapons--this is clear to everyone even without an explanation. It causes regret that someone even in France emphasizes on occasion (and even without

occasion) that there "they retain full technical capability to produce a neutron bomb, which will be begun immediately as soon as the appropriate decision has been made." Aren't these the provocative statements that are encouraging overseas strategists in their neutron expansion?

In response to indignant protests of the public, which is demanding a ban on the inhumane weapon, Washington politicians and strategists usually hear one and the same arguments that allegedly this is a "defensive" weapon and even a "humane" weapon. Just how do things stand in reality?

Many articles have been published in the American press where the defensive nature of the new means of mass destruction is "proven." For example, an article by W. Buckley published in the NEW YORK DAILY NEWS under the title "Neutron Bomb: Unique Antiwar Weapon," states that "the enhanced radiation warhead installed in an artillery shell flies at least 100 nautical miles and kills only enemy soldiers, chiefly those who are in tanks." "Is this really an offensive weapon?" asks the author. A book by the father of the neutron weapon, American Samuel Cohen, and his French like-thinker Marc Genest appeared on the shelves of bookstores in western countries: "Neutron Bomb: War Deterrent." In this "work" the latter-day advocates of neutron death present scenarios of a possible war where "the West will have to employ several hundred neutron weapons against enemy armored troops to stop aggression."

But it should be stated quite positively that neutron weapons can be used widely above all in offensive operations. An aggressor has an opportunity to fit not only artillery shells but also missiles with any radius of action, air-dropped bombs and cruise missiles with them. In case of the West's surprise attack on an "enemy" (and this version is envisaged by American strategic concepts) neutron weapons may be widely used not only against the forces, but also against the peaceful population in the zone of upcoming attack by NATO troops.

Some assert that together with the Pershings and cruise missiles the neutron bomb represents almost a messianic weapon for Western Europeans. This weapon, stated C. Weinberger "is an important element guaranteeing the security of Western Europe in the face of the Soviet threat." It is difficult to find examples of greater cynicism and distorted political thinking than such reasoning. Pentagon strategists of course intend to employ their neutron weapon not to repulse attacks by tanks with the red star on the East River in New York or on the banks of the Potomac near the Pentagon walls. The bomb WAS ESPECIALLY DESIGNED AND CREATED FOR DENSELY POPULATED AREAS OF EUROPE, where its use would be tantamount to an all-devastating neutron genocide of a peaceful population. Overseas politicians try to reassure nations of allied European countries that allegedly the neutron weapon will not be stationed on their territory without consultations with them. But this is another political trick, clumsy cosmetics for true intentions. It shouldn't be forgotten that back in 1952 the United States imposed a treaty on the FRG according to which it has the "right" to station any weapons on American military bases without control.

With respect to the "humanism" of the neutron weapon this assertion in itself indicates a dangerous anomaly in the thinking of those who are deciding NATO

policy. The fact that an enhanced radiation weapon destroys people above all while preserving housing and industrial enterprises relatively intact has begun to be put forth by instigators of nuclear warfare almost as the pinnacle of humanism in the last quarter of the 20th century. In this case normal people encounter the unprecedented fact of deeply distorted thinking of those who pray to the neutron Moloch and who care not a bit about human life. Why the plants, houses and utilities if there will be no man? By what scale of values are people guided who actually assert that devastating genocide is a contemporary humanistic principle? The cannibal logic of those who are ready to turn Europe into an asphalt desert and ghost cities for the sake of a maniacal idea of world leadership cannot be understood by a normal person.

Such views are inserted wholly into official strategic lines of the American administration and its military leaders.

A new war involving neutron weapons unleashed by Washington (true, with measures of cover and deception and political camouflage) demands higher vigilance of nations. These maneuvers are in the channel of the Pentagon's main strategic concept of making Europe the epicenter of catastrophe in case of a war toward which they are shoving the world. The more nuclear weapons employed in Western Europe in case of war, figure the planners from the American Defense Department, the fewer of them will directly hit the United States. The foolhardiness of these calculations is apparent.

Security can be guaranteed not by new hundreds of missiles and new kinds of weapons or "updated" military doctrines, but only by the capability of showing a will for peace, political realism, and the capability for that compromise which would proceed from the principle of equality and equal security.

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