

## Introduction to Chemical Armament in the War Against People (the Russian's tragic experience)

by Lev A. Fedorov

### VOLUME I. A LONG WAY TO CHEMICAL WAR

## Chapter 6. The Big War

*Each army finishes the previous war. In the desire to possess the serious weapon of the World War I - the chemical weapon - the Soviet power and a management of the Red Army cost each other. Nevertheless it is necessary to recognize, that if the Soviet power perhaps wished to have means of a chemical attack for the decision of political problems the army was constantly operating motor which induced authority to make necessary decisions, and the industry - to move in a direction of creation and use all of new and new capacities on production of the chemical weapon.*

*Fortunately, the chemical weapon in that the hardest Great Patriotic War has not been used. Unfortunately, in the chapter of the country, and also its industry and army, there were in those days not most qualified and humane persons. As a result chemical losses among the people in the country were, and there were they very much greater.*

### 6.1. TO BATTLE WITH IMPERIALISTS ARE READY

During the period between world wars of the USSR it was prepared for chemical offensive. However this path was uneasy. Anyway representations about readiness for an offensive chemical warfare essentially changed from one historical epoch to another.

Perhaps, the first serious occasion after the termination of Civil War to analyse readiness for the beginning of a real chemical warfare has been bound to an intense situation on Chinese-East railway which has developed in second half 1920s. This road was in a joint management of the USSR and China and was a source of conflicts.

Opposition to "the Chinese militarists" in 1929 has inevitably bared a problem, with what forces Independent Far East Army can be sent in chemical battle. Calculation of forces and means occurred all the autumn long, and military chemists have not stood aside, as the pretext was - the trapped shell calibre 76 mm in filling of as if chloropicrin (so experts military-chemical proving ground at Kuzminki have defined). As wrote in one of papers of that autumn I.M. Fishman, conditions severo-manchzhurskogo region - both topographical, and climatic - "favour" to use toxic smoke candles, devices for dispersion chemical warfare agents from the plane etc.<sup>304</sup>. Chief Military Chemical Directorate of Red Army especially rejoiced to that circumstance, that application of toxic smokes and fragmentary-chemical artillery shells can be effective owing to absence in respirators armies of China of the newest filters of those years.

"Under condition of the basic decision on application possibility means a chemical attack" Independent Far East Army could receive, taking into account all presence, the following artillery chemical shells (equipped, since 1926):

- calibre 76 mm 260,000 pieces (in filling of non-persistent chemical warfare agents),
- calibre 76 mm 59,000 pieces (in filling of persistent chemical warfare agents),
- calibre 107 mm 33,000 pieces (in filling of non-persistent chemical warfare agents),
- calibre 107 mm 20,000 pieces (in filling of persistent chemical warfare agents),
- calibre 122 mm 65,000 pieces (in filling of non-persistent chemical warfare agents),
- calibre 122 mm 100,000 pieces (in filling of persistent chemical warfare agents).

Besides it, Artillery Management of Red Army had 340 000 artillery chemical shells the various calibres which were equipped in days of World War I and having doubtful quality. War on Chinese-East railway could be delayed. Therefore planning was led proceeding from so-called 10th variant of the

mobilisation plan which provided reception of shells from the industry within 6 months of war in following quantities:

- 76 chemical artillery shells 228,570 pieces,
- 76 mm fragmentary-chemical artillery shells 80,534 pieces,
- 107 mm chemical artillery shells 76,998 pieces,
- 122 mm howitzer chemical shells 178,749 pieces.
- 

However chemical warfare agents that autumn of 1929 was not (was only on 10-100 tonnes depending on a kind chemical warfare agents). Therefore military chemists led calculation, proceeding from planned mobilisation powers of a chemical industry under the so-called mobilisation plan "C": on mustard gas - 6800 tonnes per year, on phosgene - 2000 tonnes, on diphosgene - 600 tonnes, on diphenylchloroarsine - 600 tonnes, on adamsite - 200 tonnes, on chloroacetophenone - 300 tonnes<sup>391</sup>. However, all these calculations cost not much, as actually at this rate the industry could not work - digits were frankly exaggerated. Nevertheless I.M. Fishman certified an army management about delivering possibility on front during half a year 1000 tonnes mustard gas. Hardly this promise was correct if to consider, that all available means battle use of mustard gas (aircraft spray tanks and NPZ) could contain no more than 400 tonnes it chemical warfare agents. Besides in the industry for that moment it has been reserved sulfurs only on manufacturing 600 tonnes mustard gas.

In April, 1930 a theme "About a condition and mobilisation readiness on respirators and chemical warfare agents" was discussed at session the Revolutionary military council. It has been recognised, that "mobilisation readiness of the industry on production of chemical warfare agents is extremely low, actions Supreme council national economy are absolutely insufficient"<sup>382</sup>.

The activity result on creation of the Soviet industry of a chemical warfare was that. From May, 1925 till May, 1st, 1936 in the country it has been produced 4933 tonnes mustard gas from which the most part was stored on military depots (the rest it has been spent for battle study and "has served term"). Also it has been produced 150 tonnes Lewisite, and it all was on depots (table 6.1)<sup>477</sup>.

**Table 6.1. The balance sheet of chemical property Red Army during 1925-1936<sup>477</sup>**

Name	Produced in 1925-1936	Was available in Red Army for May, 1st 1936
<b>Chemical warfare agents (tonnes)</b>		
Mustard gas (XX)	4933,216	4023,375
Lewisite (XXI)	150,442	149,563
Diphosgene (XIV)	150,149	8,904
<b>Chemical arms</b>		
BKhM-1	465	455
BKhM-3	602	578
BKhM-4 (T-27)	187	186
New BKhM-4 (T-37)	45	45
Tank-truck YaG-4	69	69
AKhI-3	10	10
Pouring station ARS-1	285	240
Mortars	860	
Old 107 мм		202
Обр.1931, 1933 и 1934 г.		533
Mines (non-persistent chemical warfare agents)	14808	5346
Mines (persistent chemical warfare agents)	64000	30608
Devices NPZ-3	27879	18644
Devices VDP-1	4716	4666
Chemical land mines KhF-3	31604	17735

Germany had by then no similar successes<sup>10</sup>.

In Soviet Union next decision Council of work and defence on February, 19th, 1936 was accepted. This time it was a question about production in 1936 of the next party mustard gas for expansion of a

strategic reserve of the country (the size all the same - 1000 tonnes)<sup>399</sup>. Mustard gas has been produced on plant № 91 at Stalingrad and all party has been sent in Far East military-chemical depots № 147, 148, 300, 301 and also on Pacific fleet. As shock production of mustard gas it has been carried out in December, transportation have decided to carry out in special warmed cisterns. It has come to an end badly. Mustard gas during expedition has frozen – cisterns it was necessary to heat on road, however it to do did not begin.

In second half 1930s conflict situations at Soviet Union was still much, however it has not entered yet in World War II. Meanwhile the industry of Germany for which that war has begun in 1939, has begun active production mustard gas<sup>10</sup>.

Serious check of the Soviet military-chemical forces has occurred during the most improper time - in a bitter cold during war to Finland (30.11.1939-12.3.1940). The Red Army has tried to be prepared for this chemical warfare seriously, and first of all it was a question of use of forces of aircraft which began to be considered by then as a striking force of a chemical attack. Ground forces too were going to be at war seriously. However, this chemical conflict also has not taken place<sup>357,358</sup>.

And ahead there was a Big War.

Table 6.2 for an example generalises two types of battle chemical means which were reserved by Red Army at the moment of beginning World War II when Poland was enemy of A.A.Hitler, and Soviet Union still consisted in friend of A.A.Hitler<sup>109</sup>.

**Table 6.2. Presence at Red Army mustard gas (XX) and toxic smoke candles (as of 1.9.1939)**<sup>109</sup>

Districts and separate Armies	Presence on depots	
	Mustard gas, Tonnes	Toxic smoke candles, pieces
<b>West</b>		
Moscow military district	70,2	407
Leningrad military district	88,13	43200
Kiev military district	24,97	63028
Kalinin military district	62,4	-
Belarus military district	549,1	77380
Kharkov military district	-	-
Oryol military district	-	-
Total on the western districts	794,8	
<b>East</b>		
I Independent Far East Army	1083	223679
II Independent Far East Army	1136,3	184048
Transbaikalian military district	1311	124973
Sredne-Asian military district	73	-
North Caucasian military district	7	
Transcaucasian military district	9	
Ural military district	-	-
Siberian military district	50	6498
Total on east districts	3669,3	
<b>Total</b>	<b>4464,1</b>	

Resulted in table 6.2 data show, with whom exactly the Red Army assumed to be at war those years. And with what use of chemical means. Mobilisation stocks of mustard gas still kept at level more than 4000 tonnes and with its help it was supposed to solve serious operational tasks. And toxic smoke candles it was supposed to use for an emaciation of the probable opponent in the near battle. Data table 6.3 show, that c aircraft use assumed to deliver chemical warfare agents (persistent chemical warfare agents, and non-persistent chemical warfare agents) not to all directions, and according to a policy of the country leaders those pre-war years.

**Table 6.3. Stocks Soviet aviation chemical munitions (as of 1.1.1940)**<sup>481</sup>

Districts and separate armies	Presence on depots			
	KhAB-500	KhAB-200	KhAB-25	AOKh-8 AOKh-10

		mustard gas	phosgene		AOKh-25
<b>Stocks of the central submission</b>					
Central depots	218	600	5452	34015	30829
1st aviation army					915
2nd aviation army				2614	
3rd aviation army		80	80		
1st army group		200		500	
<b>West</b>					
Moscow military district				378	
Baltic military district					
Kiev military district		1349	730	26497	19698
Kalinin military district					
Belarus military district		1506	1326	18246	28643
Kharkov military district					
Oryol military district					
<b>East</b>					
I Independent Far East Army		4142		27716	21572
II Independent Far East Army	130	2431	150	16303	22674
Transbaikalian military district	42	1056	549	21000	17866
Sredne-Asian military district			80	1620	
North Caucasian military district					
Transcaucasian military district					
Ural military district					
Siberian military district				2850	
<b>Total</b>	<b>390</b>	<b>11364</b>	<b>8367</b>	<b>152739</b>	

Besides a stockpiling of chemical warfare agents and aviation chemical munitions. The Air Forces of Red Army led also perspective battle planning. For a year of conducting the future chemical warfare (while hypothetical) they defined the requirement as follows. If war has taken place in 1940 for a year of conducting a real chemical warfare it was necessary for pilots: persistent chemical warfare agents - 60000 tonnes, non-persistent chemical warfare agents - 18000 tonnes. And in case of war in 1941 the requirement in aviation chemical bombs looked so: KhAB-200 - 18 000 pieces (3600 tonnes chemical warfare agents), KhAB-25 - 550 000 pieces (13750 tonnes chemical warfare agents), AOKh-15 - 1200 000 pieces (18000 tonnes chemical warfare agents), KRAB-25YaD - 35 000 pieces (875 tonnes adamsite)<sup>481</sup>. We will emphasise, that we deal absolutely with other plans in comparison with about what there was a speech in 1927 at creation of the plan of building of armed forces on 1927-1931<sup>126</sup>.

The actual order of the Air Forces for 1941 (then real war was not expected yet) was more modest, however is more various. It is useful to look at the list of those aviation chemical arms, which management of the Air Forces expected to receive on carrying out of battle study in 1941 year (for the present peace year) in filling of non-persistent chemical warfare agents: KhAB-100 in filling of hydrogen cyanide (**XV**) - 2100 pieces, KhAB-500 in filling of hydrogen cyanide - 120 pieces, KhAB-200M in filling of phosgene (**XIII**) - 200 pieces, KhAB-500M in filling of phosgene - 80 pieces. And still the Air Forces expected to receive party aviation chemical bombs in filling of persistent chemical warfare agents (mustard gas winter V.S.Zajkov + lewisite, 75:25%): KhAB-100 - 2900 pieces, KhAB-200M - 300 pieces, KhAB-500M - 300 pieces<sup>107</sup>.

**The real condition of offensive possibilities of chemical forces** shortly before beginning Great Patriotic War was reflected in the report by then chief Chemical Troops P.G. Melnikov<sup>137</sup>. The report has been referred in General Staff Red Army for half a year to Great Patriotic War.

As of November, 1940 the Red Army arranged numerous means for chemical warfare conducting - land (separate batallions the Reserve of the Hirh Command, flamethrower batallions of tank brigades and divisions, means exercises gas wave and toxic smoke attacks, artillery and mortar means) and aviation (aviation regiments and brigades armed aircraft spray tanks and aviation chemical bombs). These battle chemical means was scheduled to use for a chemical attack which had the purpose: a) a lesion of manpower with the help persistent and non-persistent chemical warfare agents; b) a destruction of manpower, hot-fire points and a tree-earthen of constructions with use flame-throwers; c) difficulty and paralyse a manoeuvre of troops of the enemy, slackening of its rates of an offensive and depressing of firmness of defence of the enemy by a terrain contamination persistent chemical warfare agents. At planning of offensive army operation those years it was supposed to start with calculation: chemical

batallions - on one on rifle corps, mortar batallions - too on one on rifle corps, chemicalizational air regiments - on one on an aviation division, flamethrower batallions - on one on each tank division or a brigade. For one day of battle was scheduled to use: 0,5 chargings chemical warfare agents for land means, 3-4 chargings chemical warfare agents for aircraft, 1-2 ammunition loads aviation chemical bombs, artillery chemical shells and chemical mines, 50-60 thousand toxic smoke candles<sup>137</sup>.

Table 6.4 generalises possibilities of units and subdivisions at the organisation of offensive chemical operations which the Red Army arranged shortly before beginning Great Patriotic War<sup>137</sup>. (*Table 6.4 is not in the translation provided by Dr. Fedorov.*)

Apparently, separate chemical batallion the Reserve of the High Command became powerful offensive battle unit at a contamination persistent chemical warfare agents area and roads. Collaterally organised separate batallions of anti-gas defence actually were not strictly defensive<sup>143</sup> and by means of available on their arms vehicles type ARS could provide also a contamination with use persistent chemical warfare agents area and roads. And the chemical units which have become recently all-Army (flamethrower batallions of tank brigades and divisions), in sense of a contamination of roads also could very many. The same concerns chemical possibilities of artillery units which with use artillery chemical shells could provide terrain contamination persistent chemical warfare agents or neutralization of hot-fire means and manpower enemy with use persistent and non-persistent chemical warfare agents. And the mortar batallion was capable to engage manpower the enemy with use non-persistent chemical warfare agents, and also to contaminate district with use persistent chemical warfare agents. Possibilities of aircraft of Red Army to the extremity of 1940 also were great. One air regiment, armed bombers type SB, could or with use persistent chemical warfare agents for one start to carry out a lesion manpower the enemy with a simultaneous terrain contamination, or with use non-persistent chemical warfare agents to provide a lesion manpower the enemy on the considerable areas<sup>137</sup>.

It is necessary to emphasise, that intensive battle chemical preparation of various combat arms of Red Army which passed in 1939-1940 in "front" (Belarus military district<sup>355,360</sup>, Kiev military district<sup>356,362</sup>, Leningrad military district<sup>365</sup>, Transbaikalian military district<sup>361</sup> etc.), and also in other military districts, at the final stage already whenever possible considered experience of not taken place chemical warfare with Finland<sup>363</sup>. Pilots were especially active<sup>366</sup>. A various sort manoeuvres passed with real chemical warfare agents<sup>352,489</sup>.

There were also new instructive materials which whenever possible considered last trends in preparation for a chemical warfare<sup>137,225,293</sup>.

Here so, possessing powerful land means a chemical attack the Reserve of the Hirh Command<sup>107</sup>, the most powerful aviachemical service<sup>84</sup>, the big stocks aviation<sup>102,111</sup>, artillery<sup>86,107</sup>, tank<sup>108,112</sup>, naval<sup>105</sup> and other chemical weapon, the Red Army has entered in Great Patriotic War.

Let's emphasise, that by then **in Soviet the Union has developed Military-chemical complex** - the powerful and well structured commonwealth of three forces - army, chemical industry, and also serving them, but for the present weak, special medicine<sup>1,12</sup>. A little that knew other countries about real offensive chemical possibilities of Red Army<sup>34</sup>. However, fortunately for mankind then Big Chemical Warfare has not taken place - customers (a political management of the countries-participants) could manage on fields of battles without a chemical weapon.

## **6.2. WINTER WAR AND OTHER EVENTS OF 1938-1940**

Reverting to wars of Red Army of 1938-1940 in the Far East, in Mongolia, Finland and on other theatres, we will note information uncertainty. Some historians believe, that in these conflicts military-chemical forces as if involved only flamethrower means. However this judgement is true only partly.

Let's revert to events around **lake Hasan** (Primorye krai, 29.7-11.8.1938), in which process as if "the Soviet troops have routed and have rejected invaded on territory of the USSR the Japanese troops". The guideline people's commissar for defence K.I. Voroshilov "about reduction of all front in a combat readiness" V.K.Blucher has received long before the conflict beginning (and "provocations" of the Japanese troops). And troops went on next "front" seriously, with all battle property, including with chemical warfare agents. Anyway in the order on I Independent Far East Army soon after "conflict" lesions mustard gas workers simultaneously on several depots (on July, 20th on depot № 150, Sunguch; on July, 21st on depot № 300, Knorring; on July, 28th on depot № 301, Vozdvizhenskii) have been discussed. Clearly, that

chemical depots pumping-overs of mustard gas have simultaneously and urgently started to carry out all. And all it occurred prior to the beginning of "conflict" and is so urgent, that norms of safety thus were not observed. The regrettable episode has happened during movement of 31st cavalry division from a place of its dislocation on the south. In this moving participated also 13 barrels in filling of mustard gas. Probably, we would not learn about it and about preparation for chemical attack against Japanese "aggressors" if during transportation one of barrel has not begun to flow. It has inevitably led to occurrence of the terrible order of the military principal which has appeared is accessible to historians only today<sup>492</sup>.

**War in Mongolia** would look like more or less flamethrower. In July-September, 1939 tank companies of 33rd chemicalization tank brigade Transbaikalian military district have left a place of the constant placement around halt № 74 (Chita oblast). After a march they have appeared in territory of Mongolia where around the river the Halhin-goal and lakes Buir-Nur were occupied "with a flame throwing in offensive to battle". In 24 attacks have taken part chemical tanks AKhT-130 which have been framed for disabling of the big groupings of the enemy<sup>364</sup>.

War against **Finland**, called by the Soviet-Finnish conflict 30.11.1939-12.3.1940, has officially begun because of incident on the border, happened on November, 26th, 1939. After that Soviet Union has refused joint investigation and has terminated the Soviet-finnish non-aggression pact.

Actually that conflict prepared in advance. The active participant of those events K.T.Meretskov has written in the memoirs<sup>768</sup>, that else in June, 1939 J.V. Stalin has charged to it to begin preparation for rebuff of predicted "aggression" of Finland. During that occurring J.V. Stalin has yielded the task to prepare the plan "counterblow on armed forces of Finland in case of military provocation from their side". In July K.T.Meretskov has visited again the Kremlin for the report on the future plan "rebuff to aggressors". Actually intrusion into Finland has begun in the end of November. However, K.T.Meretskov<sup>768</sup> has refused memory when from planes and tanks it was necessary to pass to analysis of chemical partition of "winter" war.

However, from documents which have been prepared after the termination of that war, the chemical side of events is clear enough. In April, 1940 the armies of North-West front have reported about the done work. 9th army has reported, that "during military actions at the front 9th army the means of a chemical attack the opponent **were not applied**". A number of reports on application chemical warfare agents the opponent after investigation appeared **wrong**". The report of 8th army was more detailed. It has appeared, that for two-month "the preparatory period" our "troops have been provided by respirators on 100%". When 8th army has passed frontier it has appeared, that in Finland "the staff of units of the opponent is provided by respirators not completely - roughly on 50-60%". Thus, this (8th) army also should report to Moscow the obvious: "opponent the means of a chemical attack **did not apply**". All these confidential revelations have occurred, however, only **after** war with Finland. And during that war the situation developed absolutely differently.

From the side USSR in war with Finland participated six armies of North-West front, to which the Leningrad military district has been transformed for the period of winter war: 7th (a main axis of advance, commander K.T.Meretskov), 8th, 9th, 13th, 14th and 15th armies. Concerning chemical opposition the real plot was that. On December, 7th during offensive battles at river crossing Uksun-Joki 8th army has applied a smoke screen of a neutral smoke (so it has been reported to Moscow), and "the opponent has hasty receded under moral influence of the occurred smoke".

Thus, **the army of Finland** not only **was not going to conduct chemical warfare against the USSR**, it simply was not ready to such war. Moreover, having framed the most reliable in the defensive relation line Mannerheim, the army of Finland was frightened in such trifling occasions, as an ordinary smoke screen of a neutral smoke.

In the end of December command of North-West front has thought up signs of application by Finland of a chemical weapon. To Moscow it has been reported, that on December, 24th during bombing of command point of 8th army the Finnish army as if used aviation bomb in filling hydrogen cyanide (and there was that bomb unique of 10 bombs which have been applied that day). That fact is especially surprising, that in chemical aggressors have enlisted hydrogen cyanide (**XV**). It is known, that allied the Finnish army the German army after 1941 very much was surprised to successes of Red Army in readiness for application hydrogen cyanide - those years this problem from the point of view of technical was difficultly realised, and it has not been solved<sup>34</sup>. And in USSR its have solved.

After has been decided to consider army of Finland as a source of chemical threat, the system of preparation for a chemical attack has started to operate. Right after "detection" in 8th army hydrogen

cyanide the Finnish parentage on front have left principals Military Chemical Directorate. During the period between December, 29th, 1939 and on January, 7th, 1940 they have checked up readiness "units of Red Army in the chemical relation". Accordingly, there were purposes for chemical attack<sup>357</sup>. They were defined by chief Military Chemical Directorate of Red Army P.G. Melnikov. Among the purposes 18 human settlements of "opponent" appeared.

At the front 8th army as it has appeared, "a chemical weapon in the yielded situation rather effectively to use". Application non-persistent chemical warfare agents with use aviation means (bombings and pourings out) has been recognised expedient. It was supposed forces of two air regiments to spend for one start on 60 tonnes chemical warfare agents. It was besides, supposed for a start bomber regiment to use on 30 tonnes aviation chemical bombs (120 pieces)<sup>357</sup>. At the front 13th army, whose right flank attacked Keksgolm (nowadays Priozersk), and left Antrea (Kamnogorsk) was is considered effective to apply toxic smoke cloud on an emaciation. Calculation - to spend 50 thousand toxic smoke candles YaM-11 within 10 hours at the front to 5 km. Sites for application non-persistent chemical warfare agents (the expense - 30 tonnes forces of one air regiment), and also persistent chemical warfare agents (a site in the size 1,5 km<sup>2</sup>, the expense - 150 tonnes) by pouring out from planes have been defined. At the front 7th army which under command K.A.Meretskov went on outbreak in a direction to Vyborg, also have been formulated "the favourable large purposes" for use persistent and non-persistent chemical warfare agents<sup>357</sup>. And at the front 9th and 14th armies which operated far from outbreak, chemical weapon application was inexpedient: "absence of the favourable purposes", difficulty of delivery of considerable quantities chemical warfare agents, the big frosts and polar night.

Reverting to practical preparation of a chemical warfare, we will especially survey activity of 8th army - that, to whose headquarters as if has fallen Finnish bomb in filling of hydrogen cyanide (we will remind, that after war this army reported to Moscow: "The opponent **did not apply** the means of chemical attack"). On January, On January, 1st, 1940 the commanding Air Forces of 8th army have issued the order on preparation for operations with use of chemical weapon. In particular, chemical squadrons in 72nd and 18th SB aviation regiments have been prescribed. Soon chemical squadrons have been defined in all bomber and fighting regiments of 8th army. Similarly there was a chemical preparation in ground forces units. In 8th army two chemical tank batallions have entered (219th and 201st). On their arms as of February, 18th, 1940 was available nearby 100 chemical tanks KhT-26 (BKHM-3). 13th army too had tank batallion (204th) in which after an end of the war for 1.4.1940 years, that is after military losses, was available 32 chemical tanks (14 tanks of type KhT-26, 14 - KhT-130 and 4 - KhT-133). 18 chemical tanks was on arms of other units of 13th army. For February, 1st, 1940 10 chemical tanks was available also in 9th army.

Besides special tanks, within the limits of preparation for a chemical attack the front has requested a chemical weapon (chemical warfare agents, aircraft spray tanks, aviation chemical bombs, chemical vehicles ARS) from inner depots. For January-February only for aircraft of 8th army the stock aviation chemical bombs, sufficient for realisation of 474 sortie with use of planes SB has been delivered. After reception of party aircraft spray tanks since January, 20th in aircraft of 8th army trainings on aim pouring out chemical warfare agents have begun: in a bomber aircraft - from heights from 500 to 3000 m, in fighter aviation - from heights 25-50 m. By February, 29th two squadrons SB and one squadron I-15 have been prepared for pouring out chemical warfare agents. For revealing of efficiency of application persistent chemical warfare agents in wood conditions it has been conducted two pourings out on a coniferous forest.

The aircraft 8th army by March, 1st was ready on the front to wide application of a chemical weapon against troops of Finland. Chemical tank batallions of this army were prepared also. In total in depots Leningrad military district as of January, 10th, 1940 there was a considerable stock aviation chemical bombs for maintenance of all armies of North-West front: 2672 bombs KhAB-200, 21124 bombs KhAB-25, and also 7760 fragmentary chemical aviation bombs (AOKh-8, AOKh-10 and AOKh-25). By January, 20th it was scheduled a tax on depots Leningrad military district 800 more bombs KhAB-200 and 10000 bombs KhAB-25.

As a whole the Red Army has not coped with a problem. The reason has been compelled to formulate G.K. Zhukov in many years: "rather small war with Finland has shown our weak combat readiness"<sup>767</sup>. The ending is that. The Red Army had not to apply actually a chemical weapon in war with Finland - on March, 12th this fight was disgracefully completed. Escaping of a chemical warfare with Finland has been carried out by the same order, as an input in it. After reduction of chemical property in order of its path dispersed: from 7th and 13th armies chemical warfare agents and BKHM it was ordered to send on military-chemical depot Leningrad military district (depot № 302); from 8th, 9th, 14th and 15th armies chemical warfare agents should be sent on the West, in Belarus military district on depot № 137 at Rzanitsa

(Bryansk oblast), and BKhM - to Moscow on depot № 136 at Ochakovo.

### **6.3. THE GREAT PATRIOTIC WAR**

War of 1941-1945 against Germany became for Soviet Union Great Patriotic War not at once. Because J.V. Stalin for it did not wait. By 1941 real level of Red Army was that, that for the first months of that serious war the army of Germany has finished regular army of Soviet Union. And with great commander J.V. Stalin. After that the country was defended by not so much Soviet Army, how many all people, enforced to study to be at war on the move. At the front and in rear.

However even the most detailed memoirs on that hardest war do not contain mentions of real affairs Soviet Chemical Troops<sup>767</sup>. Because on battle front the course of world development, fortunately, has not led to chemical weapon application in the offensive purposes<sup>32,34</sup>. Soviet Union has had the big "chemical" losses only in back, that is on industrial front. The reasons of that "chemistry" did not become the participant of military actions, name different. Anyway as of 1942 the Soviet military chemists did not expect for themselves serious surprises<sup>53,769</sup>. But Chemical Troops Red Army have taken part in the organisation of a surprise for the German troops. According to historians Soviet Chemical Troops, in July, 1942 at the military-chemical chief of Red Army V.V. Aborenkov which then has been subordinated directly J.V. Stalin, in July, 1942 there was new deputy chief I.F. Chukhnov<sup>32</sup>.

Following events preceded it. In April, 1938 people's commissar for defence K.I. Voroshilov has approved the new name to institute of biological war (**Sanitary-Tchnical institute**) which at that time was on island Gorodnija on lake Seliger. Soon after that K.I. Voroshilov has made this institute absolutely independent and even has formed in it a military council. The member of the military council became I.F. Chukhnov, arrived from a small post in military-chemical school in the city of Kalinin<sup>54</sup>.

Level of secrecy of the works conducted in Sanitary-Tchnical institute, was draconian. We will give an example. When military pilots have wanted to learn, they should deal with what substances, by it has been reported, that it is a question about chemical warfare agents with following properties: "as a rule, liquids of a specific gravity from 1,05 to 1,5... with the freezing temperature close to water. For winter conditions freezing temperature can be finished to -40°C... Into composition chemical warfare agents enter, as a rule: the water, some neutral salts (NaCl, Na<sub>2</sub>HPO<sub>4</sub>, etc.), traces of albuminous products, sometimes glycerine and special substances. Viscous chemical warfare agents, besides the named products, contain still "fillers"... Chemical warfare agents maintains immediate contact only with stainless steels... Chemical warfare agents without serious consequences maintain explosion, that is a heat and high pressure of instant action. To temperature above +10°C chemical warfare agents concern worse, than low temperatures. Freezing maintain well. At storing in ambient temperature start to lose the toxic properties and at +56°C become neutral. Storing maintain only at the temperature close to zero... Terms storing are defined by the formula of chemical warfare agents and, as a rule, do not exceed 10-15 days... The majority chemical warfare agents intends for application in deep rear of the opponent, for lesion its manpower. . Disable of engaging persons begins after several days (from 2 to 7) from the moment of application chemical warfare agents"<sup>54</sup>.

Certainly, today it is obvious, that speech in that "cipher communication" went not about chemical warfare agents, and about the biological weapon. And nowadays we already know, that two - anthrax and toxine of a botulism were leaders among those biological formulas<sup>54</sup>.

However in the summer of 1942 I.F. Chukhnov developed absolutely other plot. It was serious days for the Soviet Army when German tanks unconstrained advanced towards Volga. In the late summer of 1942 occurrence in the ranks of German army of the big number sick of a tularemia, has led to a time halt of offensive. However originators of a trouble - septic rodents - have been deprived feeling of the Soviet patriotism, and within a week after epidemic beginning in German troops this epidemic was threw together with rodents on territory of the Soviet soldiers and peace inhabitants.

About preparation for a counteroffensive around Stalingrad which should begin on November, 19th, 1942, the commander of 16th air army S.I. Rudenko recollected so: "Ten days preceding a counteroffensive, have appeared drama for 16th air army. In first half of November us have warned about irruption of mice. Besides rodents have appeared are sick of a tularemia - a mouse cholera. Most of all has not carried to an army headquarters. Making through into houses, mice infected products and water, people were ill. And it was impossible to transfer a headquarters as the communication line should lay anew. My substituents Soon were ill. Signalmen and physicians then were ill. Illness at all proceeded hardly, with a

heat. There were even two lethal events. In a system there were only two: I and lieutenant colonel Noskov from an operations section... And operation term already came nearer".

To cope with this sudden and hardly prognosticated I.F. Chukhnov a trouble, command of Red Army has been compelled to throw to the place of events of 10 mobile hospitals. In the organizational plan it was easy for making, as the participant of works on creation of the biological weapon on the basis of bacteria of a tularemia general E.I. Smirnov was at that time the chief of the Main Military-medical management of Red Army<sup>54,770</sup>.

In favour of artificial character of epidemic of 1942 the facts testify. It is difficult to explain infection occurrence only at one belligerent party if epidemic had a natural origin. The statistical information testifies, that on the average total number ill with a tularemia made normally nearby 10 000 persons on weigh Soviet Union (such number of the diseased was in the USSR both in 1941, and in 1943) and only in 1942 it has increased in 10 times, to approximately 100 000 persons<sup>54,770</sup>. By the way, 70% of victims were ill with the pulmonary form of a tularemia which could occur only artificially. We will emphasise, that failure with battle use of a tularemia against troops of Germany had two consequence. In the future the biological weapon was not scheduled any more for problem solving of near battle (in the summer of 1942 it happens more likely with despair). And to military-biological institute, it was necessary to participate in penicillinum creation as effective remedy at extirpation with mass epidemics<sup>54,770</sup>.

Certainly, in official texts about activity in days of war of the Soviet military chemists and personally I.F. Chukhnov it is not present anything. Mainly there their achievements directed by smoke screens and in a flame throwing are described<sup>32</sup>.

However, official sources have not avoided a mention of some actual affairs conducted by military chemists during Great Patriotic War. In particular, chemical investigation was conducted actively in territory of the countries of Europe. The Soviet military-chemical scouts have found in Hungary in 1944 a large factory to the west of Budapest which manufactured chemical warfare agents. However, to trap trophies (1000 barrels with mustard gas etc.) it was not possible - it has been taken out towards Austria. Scouts have found many trophies also in Germany in a warehouse in region Dessau: 243000 artillery chemical shells, more than 25000 chemical land mines and 1248 tonnes chemical warfare agents in other covers<sup>32</sup>. About the trophies found in region Dyhernfurth (Poland) conversation will go more low<sup>428</sup>.

We will be retried. Fortunately for mankind then, in 1941-1945, on fields of battles Big Chemical Warfare has not taken place - customers (a political management of the countries-participants) could do without a chemical weapon.

#### **6.4. MILITARY-CHEMICAL ACHIEVEMENTS**

In rear all was in another way. With the beginning of world war activity Soviet Military-chemical complex on preparation for an offensive chemical warfare has notably increased. Last one and a half peace year before June, 22nd, 1941 all have passed under a sign on new and new events on industrially-chemical front.

In particular, in one of joint documents of the government of the USSR and the Communist party management many tasks for 1940 were mentioned: to instal workshops for filling into artillery chemical shells (on plants at Stalinogorsk and Chapaevsk), to instal workshop on plant № 96 at Dzerzhinsk (mustard gas Levinstein) and hydrogen cyanide on plant at Chernoreche-Dzerzhinsk, etc. The Economic Council at the government of the USSR has approved in March, 1940 a place of placement of the future factory "Sovprene" № 2 at Kemerovo. Among rubber production missions others have been disguised also: the organisation of productions mustard gas and lewisite (powers, accordingly, 4000 and 4500 tonnes per year), and also the organisation workshop for filling of chemical warfare agents into artillery chemical shells (on 2150 thousand pieces per year) or KhAB-25 (380 thousand pieces). Chemical sector State Planning Committe has been anxious by commissioning in 1940-1941 of productions calcium carbide, necessary for production of lewisite. Places of their placement – military-chemical plants №№ 91, 96, 102 and 148. In the order on chemical industry department for 1940 numerous commissions to factories have been defined. On a plant № 96 (Dzerzhinsk) was scheduled to complete installation workshops where it was necessary to synthesise lewisite. On plant № 91 (Stalingrad) should complete construction of two buildings for filling of chemical warfare agents into chemical munitions and improve technology production of mustard gas. On plant № 102 (Chapaevsk) has been planned to reconstruct workshops for production of lewisite and for filling of chemical warfare agents into chemical munitions. And for 1941 the order on department of a

chemical industry to chemical warfare factories also had been yielded many tasks. On plant № 96 was scheduled to start up by May, 5th production mustard gas V.S.Zajkov, and also to master in II quarter production lewisite. The plant № 91 should learn to take the sulphur cleared of impurities after production mustard gas and to revert it in a production cycle. On plant № 102 to summer of 1941 has been planned to repair the equipment of two workshops - productions mustard gas and productions phosgene. And plant № 100 (Stalinogorsk) it was ordered to result by August, 1st in full readiness workshop on production mustard gas and to complete construction workshop for filling of chemical warfare agents into aviation chemical bombs<sup>422</sup>.

With beginning Great Patriotic War the situation in "chemical" rear has developed as hardly, as well as at the front<sup>386,423-425,431,771</sup>. It is possible to regret only, that for their description it is impossible to use official publications<sup>719,720</sup> which have been let out after 1987 and nevertheless do not contain a trustworthy information.

Powers on production of chemical warfare agents, prepared in Ukraine, because of difficulties of initial stage Great Patriotic War have been excluded from a turn. In general war has gone in such a manner that not all from number of numerous productions chemical warfare agents, prepared in premilitary years, could be engaged in after June, 22nd, 1941 the direct business.

The first months Great Patriotic War have demonstrated low readiness workshops chemical warfare agents to the direct business.

Powers on production of **mustard gas (XX)** in Moscow on plant № 51 were not mobilised. However, mustard gas workshop of plant № 100 at Stalinogorsk not only was not a secret for military "friends" from Germany and Italy<sup>681</sup>, but also in a peace time has not been tested. Accordingly, as high checking persons in February, 1942<sup>425</sup> "have found out", at attempt of start-up of it workshop the equipment continuously failed. Has not been tested in a peace time also mustard gas workshop of plant № 96 at Dzerzhinsk<sup>425</sup>. As follows from table 4.1, four plants (№ 91 at Stalingrad, № 96 at Dzerzhinsk, № 102 at Chapaevsk and № 761 at Berezniki) participated in production of mustard gas with a full strain of forces. Filling of mustard gas into chemical munitions carried out plants at Chapaevsk, Dzerzhinsk and Stalingrad. To an end of the war filling of mustard gas in munitions has begun also at Kirovo-Chepetsk (Kirov oblast, then it was plant № 752) with use of imported raw materials<sup>772</sup>. Besides, to and in a course of war attempts to organise production of mustard gas at Usolye-Siberian, Kemerovo, Yaroslavl, Ufa etc. were undertaken

Serious production of **lewisite (XXI)** it was scheduled from second half 1930s, however because of raw and technological difficulties actually it has begun only in beginning Great Patriotic War. In a peace time workshop lewisite on plant № 96 at Dzerzhinsk in general has not been tested, and when it has started to work, was found out, that arsenic trichloride ( $AsCl_3$ ) for it to synthesise the planned method it is impossible, so it was necessary to frame workshop № 13 on a factory anew<sup>425</sup>. Powers on production of lewisite, prepared on chemical combine at Stalinogorsk, it is real have not been entered. It has not been carried out also prepared production of lewisite at Stalingrad, almost prepared production at Berezniki, and also scheduled - at Kemerovo. Actually production of lewisite proceeded during war only on plants at Chapaevsk and Dzerzhinsk (table 4.1).

In pre-war years of power on production of **phosgene (XIII)** have been prepared on many plants. However actually production of it non-persistent chemical warfare agents in days of war carried out only plants № 102 at Chapaevsk and plant at Chernoreche-Dzerzhinsk. Production of phosgene on chemical plant at Rubezhnoe (Ukraine) could not take place because of the unsuccessful beginning for Red Army Great Patriotic War. For the same reason phosgene it could not be manufactured in Moscow on plant № 51. Phosgene workshop on chemical plant at Stalingrad after a beginning of war has not started to work.

Production **hydrogen cyanide (XV)** has been prepared at Dzerzhinsk and at Voskresensk. However in a peace time workshop on plant № 148 at Dzerzhinsk has not been tested, and in a beginning of war it could work only on 40 % of power as separate aggregates did not coincide on powers<sup>425</sup>. Chemical combine at Voskresensk produced hydrogen cyanide only in 1941 whereas the basic quantities of it chemical warfare agent have been manufactured on chemical plant at Dzerzhinsk. In a course of war there were attempts to develop production of hydrogen cyanide on plant at Gubakha and on plant № 510 at Kemerovo.

Thus, though with beginning Great Patriotic War the industry of a chemical weapon of the USSR also has been mobilised for ultimate capacity, this power (actual) has appeared essentially below planned. Table 4.1 shows data about real production of chemical warfare agents in 1941-1945 on those Soviet chemical plants which actually did it (these chemical plants was only 8, instead of 23 as believed

intelligence the West<sup>34</sup>). Also data about conserved on these factories after an end of the war capacities on production of a chemical weapon (as of 1948) are cited<sup>431</sup>.

Practically all prepared in the USSR in days of war chemical warfare agents, in particular persistent chemical warfare agents, were filled into chemical munitions various calibres - aviation chemical bombs, chemical shells of tube and rocket artillery, chemical mines - and are prepared for battle use. All them the huge quantity has been let out for years of war. We will be limited, however, to the information on those kinds chemical munitions which have been equipped persistent chemical warfare agents, that is mustard gas, lewisite and their mixtures. Everything, on accounting data, munitions in filling of persistent chemical warfare agents was produced during war of 4573600 pieces (without experimental batches). And their production proceeded up to an end of the war. Table 6.5 yields the representation, what kinds and quantities aviation and artillery munitions were filled with persistent chemical warfare agents.

**Table 6.5. Production of chemical munitions filled with persistent chemical warfare agents in USSR in days of Great Patriotic War**

Type munition		Filling	Production, thousand pieces					Итого
			1941	1942	1943	1944	1945	
<b>Aviation chemical bombs</b>								
1	KhAB-500	mustard-lewisite	2.35	18.8	23.8	7.0	-	52.0
2	KhAB-200	mustard gas	-	10.5	27.3	16.4	0.06	54.3
		mustard-lewisite	4.7	3.5	-	-	-	8.2
3	KhAB-100	mustard-lewisite	1.6	22.1	71.2	27.0	1.1	123.0
4	KhAB-25	mustard-lewisite	31.1	44.0	4.0	1.5	-	80.6
<b>Artillery chemical shells</b>								
5	AKhS-76	mustard gas	-	62.0	629.3	6.9	-	698.2
6	AKhS-122	PA	30.0	197.5	182.2	102.5	1.0	513.2
		DisA	54.3	7.5	46.0	-	-	107.8
		PA	-	-	-	4.5	-	4.5
		DisA	-	-	-	20.4	2.7	23.1
7	AKhS-152	PA	0.6	50.7	78.5	9.0	-	138.8
		DisA	-	21.2	37.9	-	-	59.1
		PA	-	-	-	5.0	-	5.0
		DisA	-	-	-	8.8	-	8.8
		mustard-lewisite	-	-	-	8.8	-	8.8
<b>Chemical mines</b>								
8	M-82	mustard gas	-	0.7	195.0	718.3	-	914.0
		mustard-lewisite	0.3	18.1	547.7	907.9	35.0	1509.0
9	M-107	mustard-lewisite	-	2.0	-	-	-	2.0
10	M-120	mustard-lewisite	-	-	82.0	93.0	-	175.0
<b>Chemical shells of rocket artillery</b>								
11	MX-13	mustard-lewisite	-	48.2	35.2	13.6	-	97.0
<b>Total</b>			<b>125.0</b>	<b>506.8</b>	<b>1960.1</b>	<b>1941.8</b>	<b>39.9</b>	<b>4573.6</b>

Aviation chemical bombs KhAB-100, KhAB-200 and KhAB-500 filled with persistent chemical warfare agents produced plant № 96 at Dzerzhinsk. The Same bombs KhAB-100, KhAB-200 and KhAB-500 in filling non-persistent chemical warfare agents produced plant № 148 at Dzerzhinsk. And still aviation bombs KhAB-200 and KhAB-500 filled with non-persistent chemical warfare agents produced plant at Chernoreche-Dzerzhinsk<sup>431</sup>. Chemical mines KhM-82 OT, and also shells AKhS-76 (persistent chemical warfare agents) produced plant № 96. Plant at Chapaevsk specialised on artillery chemical shells (AKhS-122 PA and DisA, AKhS-152 PA and DisA), and also manufactured mines KhM-82 FROM. Plant № 148 produced shells AKhS-76 (non-persistent chemical warfare agents), and also chemical rocket missiles - MKh-13 (non-persistent chemical warfare agents) and MKh-31 (non-persistent chemical warfare agents). And the plant at Stalingrad made mines KhM-82 FROM, KhM-120 OT and KhM-82. Plant at Chernoreche-Dzerzhinsk also manufactured mines KhM-120 (non-persistent chemical warfare agents) and MKh-13 (non-persistent chemical warfare agents)<sup>431</sup>.

Besides chemical plants, for production of aircraft spray tanks in days of war machine-building factories have been adapted: for VAP-6M - factories №№ 43, 455 and 735, for VAP-100 - factories №№

455, 487 and 735, for VAP-250 - factories № 455 (the Moscow region) and № 145, for VAP-500, VAP-1000, UKhAP-250 and UKhAP-500 - a factory № 145<sup>431</sup>.

As to cases of all of these chemical munitions on them production many factories of all country has been supplied. Cases for artillery chemical shells AKhS-76 made plant № 68 at Nevjansk and sent them in Dzerzhinsk on a plant № 96. Cases for shells AKhS-122 made plants № 76 at Serov and № 259 at Zlatoust and sent them in Chapaevsk. Cases for chemical rocket missiles MKh-13 made plant № 78 at Chelyabinsk, and for chemical rocket missiles MKh-31 - plant № 612 at Sverdlovsk<sup>425</sup>.

Naturally, plants chemical warfare agents required chemical raw materials - sulphur and arsenic, soda and diphenylamine, calcium carbide and alumina, sulphur acid and oil coke, ethene and propene, cyanides and ethyl alcohol. And on other factories came true production of these raw materials. Sulphur manufactured 5 factories - at Alekseevskoe, Kara-Kum, Shor-Su, Gaurdak, Changyrtash. Chlorine manufactured 12 chemical plants - №№ 91 (Stalingrad), 93 (Moscow), 96 (Dzerzhinsk), 97 (Ussolye-Siberian), 100 (Stalinogorsk), 102 (Chapaevsk), 142 (Sumgait), 510 (Kemerovo), 757, 761 (Kirovo-Chepetsk), 762, plant at Chernoreche-Dzerzhinsk. The arsenic necessary for production of lewisite, adamsite and diphenylchloroarsine, manufactured 9 chemical plants. Calcium carbide (for production lewisite) went from Kirovakansky chemical plant and from plant at Chernoreche-Dzerzhinsk, and cyanide-raw (for hydrogen cyanide) - from chemical plant at Kirovakan<sup>431,425,720,774</sup>. In the course of war production of arsenic has grown. In particular, on November, 27th, 1941 the government of the USSR has disposed to enlarge arsenic production in 1942 to 22000 tonnes per year<sup>386</sup>. It was provided to dilate workshop for productions of metal arsenic on Novo-Troitsk factory (Orenburg oblast), and also to begin production of white arsenic in again constructed workshops on Angarsk plant (now - Svirsk) and on plant at Karabash. Table 6.6 contains data about production of white arsenic.

**Table 6.6. Data about arsenic production in the USSR in years Great Patriotic War<sup>774</sup>**

Plants	Production, tonnes				
	1941	1942	1943	1944	1945
<b>White arsenic (92%)</b>					
Novo-Troitsk combine	2420,4	1728,0	1330,3	1342,9	1264,2
Brich-Mulla combine	459,6	394,6	396,9	601,9	570,9
Tikeli combine	661,6	436,2	202,3	461,9	422,8
Tsan combine	164	172	124,9	78,7	111,5
Rachin combine	153,0	22,2	47,3	33,2	
Djulfa combine		125	18,6		
Darasun plant	349,5	1350,0	1040,0	525,0	494,1
Plant at Karabash	568,2	288,7	306,5	392,6	238,2
Angarskii plant	3214,6	3012,0	4163,5	3520,0	2919,0
<b>Arsenic trichloride (AsCl<sub>3</sub>)</b>					
Plant № 96 at Dzerzhinsk	713	3814	6682	2956	450
Plant № 102 at Chapaevsk	1170	1777	1585	577	-

In table 6.7 data on production of chemical warfare agents in days of Great Patriotic War are generalised. In total in 1941-1945 on 8 chemical plants it has been manufactured 122500 tonnes various persistent and non-persistent chemical warfare agents, including mustard gas - 76800 tonnes<sup>53,431</sup>. In production chemical warfare agents, chemical munitions and means of chemical protection 301 enterprise took part<sup>431</sup>.

**Table 6.7. Production chemical warfare agents in Soviet Union and Germany in years of World War I (in thousand tonnes)<sup>431,743</sup>**

Chemical warfare agent	Soviet Union						Germany
	1941	1942	1943	1944	1945	Total	
<b>S-mustard (XX)</b>	14.4	26.7	22.6	10.3	2.8	<b>76.8</b>	<b>25.0</b>
<b>N-mustard</b>						-	<b>2.0</b>
<b>Lewisite (XXI)</b>	2.2	6.1	8.5	2.9	0.5	<b>20.2</b>	-
<b>Hydrogen cyanide (XV)</b>	1.5	2.7	2.8	2.4	1.7	<b>11.1</b>	-
<b>Phosgene (XIII)</b>	0.6	1.7	2.7	2.6	0.7	<b>8.3</b>	<b>5.9</b>
<b>Adamsite (III)</b>	1.0	1.8	2.5	0.8	-	<b>6.1</b>	<b>3.9</b>

Arsine oil							7.5
Diphenylchloroarsine (IV)							1.5
Diphenylcyanoarsine (V)							0.1
Chloroacetophenone (II)							7.1
Tabun (XXII)						-	12.0
<b>Total</b>	<b>19.7</b>	<b>39.0</b>	<b>39.1</b>	<b>19.0</b>	<b>5.7</b>	<b>122.5</b>	<b>65.0</b>

Table 6.7 allows to compare Soviet "achievements" in production of chemical warfare agents to with what the opponent on that serious war has come. It is visible, that Soviet Union and Germany in that war had different approaches to the nomenclature of chemical warfare agents. The army of Germany basically was against battle use lewisite and hydrogen cyanide, and the Soviet military men knew about it long before a beginning of war<sup>675</sup>. Germany those years had other priorities – it was ahead from the point of view of occurrence in its arsenal of the first representative phosphorous organic chemical warfare agents (tabun).

As a whole Germany before and during World War II has manufactured and has saved up approximately 65000 tonnes chemical warfare agents<sup>743</sup> (name also other number - order 67000 tonnes<sup>10</sup>). Till the end of the XX-th century intelligence services and other western experts assumed, that for years Great Patriotic War Soviet Union could not manufacture more than 60000 tonnes chemical warfare agents<sup>34</sup>. They were mistaken. Actually, when **World War II it was completed, Germany had twice less chemical warfare agents, than Soviet Union, including mustard gas - it is three times less.** It is possible to regret only, what even today are little-informing and arrogant representatives of chemical generals of Russia who believe necessary to challenge this doubtful achievement of Soviet power<sup>775</sup> - ignorance of history of the country decorates nobody.

As to **Soviet Military-chemical complex it has completed the war successfully** (under the Soviet standards of those years). This complex has received from J.V. Stalin for the merits before the power some awards: one Stalin award of I degree for "creation" sarin<sup>202</sup>, two awards of II degree for the organisation industrial production of mustard gas (V.S.Zajkov, N.A.Bogoslovskii)<sup>776</sup> and lewisite (S.L.Warshawskii, I.H.Shenfinkel, G.F.Nehoroshev)<sup>427</sup> and one award of III degree for production adjustment of hydrogen cyanide in the new way (S.S.Bobkov, I.K.Zamaraev, V.G.Zajtsev, M.B.Zlotnik, S.M.Korsakov-Bogatkov)<sup>744</sup>.

One ill luck - the Soviet military chemists in the course of Great Patriotic War only finished chemical component World War I. This conclusion follows from comparison of efforts of the USSR and Germany on production chemical warfare agents (table 6.7). In a course of war of the USSR only tried to squeeze out a maximum of those capacities on production of chemical warfare agents which have been framed till 1940. Meanwhile the basic productions chemical warfare agents in Germany have been organised not before World War II, and in the course of World War II (that is per 1940-1944)<sup>10</sup>. And in Germany production of tabun already actively came true, production of sarin was in stages of the termination of the organisation of industrial production, and production soman - in an experimental stage. So if chemical warfare nevertheless then has burst out, the Soviet soldiers would meet in chemical battle with such unexpected German chemical warfare agents in which relation in their country while only went the secret intrigues in corridors of intelligence organs and confidential applied chemical laboratories. The result is simple for predicting.

## 6.5. CHEMICAL TROPHIES OF THE BIG WAR

Sad experience of shock production of mustard gas, lewisite and hydrogen cyanide in imperious circles has learnt anybody to nothing. The war final stage was marked not by slackening of works Military-chemical complex, and, on the contrary, a new jerk which promoted new turn in the organisation of productions of a chemical weapon, having led to the discharge beginning phosphorous organic chemical warfare agents. We mean "privatisation" by the Soviet Army of military-chemical property of Germany<sup>428,781</sup>.

Termination World War II has generated the second stage of Soviet-German military-chemical "contacts". It was materialised basically in two plots. One fell into to fate of plants on production of a chemical weapon which have been found by the Soviet Army in Germany in 1945. As most important of them were considered workshops on production of the newest and practically not known to the world phosphorous organic chemical warfare agents - tabun (XXII) and sarin (XXIII)<sup>428,781</sup>. Another concerned a trophy chemical weapon of army of Germany, found out in the Soviet zone of occupation<sup>648</sup>.

Chemical plant Anorgana GmbH was built in 1939-1942 at Dyhernfurth for production of tabun and other phosphorous organic chemical warfare agents. Production of tabun (XXII) occurred up to January,

1945, prior to the beginning of evacuation<sup>428</sup>. Here it has been framed pilot plant on production sarin (**XXIII**) (power - 300 tonnes per month), however installation of equipment in workshop on production sarin (last stage) by the moment of the Soviet capture has not been completed. The Soviet chemical scouts who in the beginning of 1945 have approached to a factory, knew what to search. On February, 9th they have found someone's notebook in factory laboratory. In it formulas chemical warfare agents (tabun and sarin) which here were manufactured contained. Arrived representative Military-chemical complex - the deputy chief of military-chemical management of Red Army I.F. Chukhnov and the chief engineer of institute of chemical warfare GSNII-42 (former plant № 51) colonel D.G.Kudrjashev - have been so informed in military-chemical secrets of Germany that have understood about what speech: the found formulas have confirmed the expected. The required chemical plant of Germany has got to them perfectly safe - the task for its bombardment was not received by any army of the world. However, the factory has got to the Soviet Army without technical documentation - by then it has been taken out by Germans on the West<sup>428</sup>.

Already on February, 16th, 1945 the principal of the Soviet chemical industry M.G.Pervuhin has reported on a find at Dyhernfurth to L.P.Berija (vice-president Committee for the Defense of the State). The Analysis of samples of substances from the trapped plant, carried out at Institute of organic chemistry of Academy of sciences of the USSR (academician A.N. Nesmeyanov, doctor of chemistry M.I. Kabachnik), and also in other laboratories (Chemical Scientific Research Institute Red Army, GSNII-42 and Military-chemical Academy), has confirmed the production fact in Dyhernfurth sarin and tabun. To be surprised to speed of the analysis it is not necessary. German phosphorous organic chemical warfare agent under a name sarin (O-isopropyl methylphosphonofluoridate) already it was known to the listed Soviet organisations. And in Chemical Scientific Research Institute Red Army and GSNII-42 already there were confidential reports on synthesis sarin, carried out in two Soviet institutes. Sarin (**XXIII**) has been synthesised in 1943 by group of academician A.E. Arbuzov in the Chemical- Technological institute in Kazan. Besides sarin, 19 related substances there have been synthesised. 7 from these substances in April, 1944 have been pitched to the analysis to Moscow, including sarin and its analogue (ethyl ether). In December, 1944 there was a report on synthesis sarin at Institute of organic chemistry of Academy of sciences (the principal of synthesis - M.I. Kabachnik, the executor - E.I.Golubeva)<sup>202</sup>. But the data about German phosphorous organic chemical warfare agents with the formula tabun (**XXII**) were in the Soviet concentration camp. The carrier of that information the lieutenant colonel G.Vesterburg sat there since 1942. Results of urgently carried out interrogation about chemical warfare agents Germany, including about tabun (gelan), have been reported J.V. Stalin on March, 10th, 1945<sup>753</sup>. In the meantime in Military-chemical Academy colonel K.A. Petrov urgently synthesised tabun under the formula found on February, 9th, 1945 general I.F. Chukhnov on a plant chemical warfare agents at Dyhernfurth<sup>202,428</sup>.

Within the limits of chemical vanity of February-March, 1945 A.N. Nesmeyanov together with the military-chemical chief of Soviet Army V.V. Aborenkov have decided to defend a priority of the USSR in the relation phosphorous organic chemical warfare agent under the name "molit" (it there was a German sarin). On February, 20th, 1945 V.V. Aborenkov has written A.N. Nesmeyanov, that it supports representation on competition of the Stalin award... M.I. Kabachnik (instead of academician A.E. Arbuzov). On February, 23rd M.I. Kabachnik has carried out the task on preparation of necessary confidential papers. On February, 27th, 1945 A.N. Nesmeyanov has written confidential representation and has referred it "to Committee on awards of a name of comrade J.V. Stalin". Soon the letter also from general V.V.Aborenkov there has entered.

Military-chemical vanity proceeded also at the state level. On March, 2nd, 1945 the principal of the Soviet chemical industry has reported in the government (G.M.Malenkov) the major details. It was reported not only about detection workshops on industrial production tabun and to pilot production sarin, and also the most powerful workshop on filling of phosphorous organic chemical agents into chemical munitions. The chemical principal asked the permission to equipment transportation of plant Anorgana GmbH to Soviet Union with the subsequent restoration workshop on plant at Stalingrad<sup>428</sup>. In 4 days after that report there was decision Committee for the Defense of the State the USSR about transportation to Soviet Union found in Dyhernfurth the equipment for productions tabun and sarin. That decision had been ordered also export of other equipment (on production hydrogen cyanide, and also workshops equipments munitions and preparations of formulas). The equipment for productions tabun and sarin has been disassembled by summer of 1945 under the guidance of the director chemical plant № 91 A.I. Ufland, then it has been transported in the USSR on this plant (Stalingrad). However the pilot equipment on production sarin has been shipped on May, 10th, 1945 not in Stalingrad, and to Moscow in GSNII-42 - main industrial institute of a chemical warfare (present GSNIIOKhT) where enthusiasts of a chemical warfare have tried to lead a pilot production sarin for needs of the Soviet Army directly in the middle Moscow<sup>428</sup>.

Military-chemical trophies were not confined to a factory in Dyhernfurth<sup>428</sup>. In total Soviet Army has found out in Germany 4 specialised plants on production of chemical warfare agents and its filling into

chemical munitions. And all of them at first have been surveyed, then their equipment has been demounted and transported to Soviet Union. The equipment on production of mustard gas in chemical plant Orgacid GmbH at Ammendorf (capacity - 10800 tonnes per year) has been taken out on chemical plant № 91 at Stalingrad. The equipment under construction at Falkenhagen military-chemical plant and an arsenal has been transported on chemical plant № 96 at Dzerzhinsk. And the equipment military-chemical plant at Locknitz (production liquid and viscous mixtures chemical warfare agents and its filling into chemical munitions) has been transported on plant № 102 at Chapaevsk<sup>781</sup>.

The Soviet Army had also other trophies. As official historians specify, it found a chemical weapon in the different countries. In particular, only in territory of Germany by the Soviet troops as if it has been found 393436 artillery chemical shells various calibres, 149485 aviation chemical bombs, 33802 chemical land mines and chemical rocket missiles, 6854 tonnes chemical warfare agents in various vessels<sup>32</sup>. Gross weight of all this property (in metal) has made 70500 tonnes<sup>648</sup>. These digits, however, stand not so expensively if to consider, that only in 1947 the Soviet Army has flooded in Baltic sea from among German trophies 415336 artillery chemical shells (it from 393435!), and the rest has sent home to Soviet Union for passage of military service. In total Soviet Army has flooded in Baltic sea not 70500 tonnes the chemical weapon which has got to it of Germany (in metal) but only only hardly there is less than half - 34000 tonnes<sup>648</sup>. In other words, if to mean net weight chemical warfare agents then **10000-13000 tonnes trophy chemical warfare agents Germany have not been flooded**, and have completed the history on battle service in Soviet Union.

Thus, from among the trapped trophy chemical weapon by Soviet Union it has been flooded 12035 tonnes chemical warfare agents (net weight, taking into account metal – 34000 tonnes)<sup>648</sup>, including: mustard gas - 7635 tonnes, adamsite - 1552 tonnes, chloroacetophenone (CN) - 559 tonnes. The operation result on an inundation is generalised in table 6.8.

**Table 6.8. Quantities German chemical warfare agents, flooded with Soviet Union in 1947 in Baltic sea**<sup>648</sup>

Chemical munitions	Quantities of chemical warfare agents, tonnes					Total
	Mustard	As-containing chemical warfare agents	Adamsite	CD	Others chemical warfare agents	
<b>First region</b> (Latitude - 56°13', Longitude - 18°54')						
Aviation bombs	512	78	51	41		682
Artillery shells	58		5	3		66
Land mines	27					27
Mines	4					4
Vessels	7	18	60		6	91
Smoke candles	-	-	6			6
Containers	-	80				80
Drums	-	-	2			2
<b>Total</b>	<b>608</b>	<b>176</b>	<b>124</b>	<b>44</b>	<b>6</b>	<b>958</b>
<b>Second region</b> (Latitude - 55°20', Longitude - 15°37')						
Aviation bombs	5920	906	591	479	-	7896
Artillery shells	671		61	36	-	768
Land mines	314					314
Mines	42					42
Vessels	80	203	693		74	1050
Smoke candles						65
Containers		924				924
Drums			18			18
<b>Total</b>	<b>7027</b>	<b>2033</b>	<b>1428</b>	<b>515</b>	<b>74</b>	<b>11077</b>
<b>General result</b>	<b>7635</b>	<b>2209</b>	<b>1552</b>	<b>559</b>	<b>80</b>	<b>12035</b>

\* \* \*

*As believes the overwhelming majority of people, including historians, the victory of the Soviet people over fascism in the Big War has done without participation of a chemical component. It is absolutely incorrect. First, chemical a victim at the Soviet country were and there were they huge. On numerous rear bastions of that war many the Soviet citizens preparing our Soviet chemical rebuff to fascist aggressors in vain have been ruined. All of them were lost from own - Soviet - a chemical weapon. Secondly, there was*

*also another - not happened - a trouble. The matter is that to that unexpected chemical "gift" - tabun and sarin, which A.A.Hitler's experts on chemical front in the end of war could refer, - the Red/Soviet Army was absolutely not ready.*