

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

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

## Chapter 2. Foreign Chemical Enemies And Friends

*As it happened in the left century not time, the desire of the Soviet power to possess a chemical arsenal has begun with attempts of use of knowledge and experience of the West. And both after the first, and after the second world wars it there could be an experience mainly Germany. With that only a difference, that after the first world war Germany participated in the Soviet chemical arms of own will and with benefit for itself, and after the second - as the lost party. There was, however, a considerable information military-chemical extraction. And not only German.*

### 2.1. THE SOVIET INTELLIGENCE

The involvement of Soviet intelligence in service of the of the Soviet military-chemical complex has old history. And its achievements in getting of secrets in field of the another's chemical and biological weapon were not less impressing, than in theft of secrets in the field of the weapon nuclear.

On March, 22nd, 1922 chemical department of Artillery committee put some questions, connected with a supply with information military-chemical art in republic by means of getting the necessary foreign information<sup>63</sup>. These offers have been listed in the letter from April, 8th, 1922, in which the chief of artillery of the Red Army Y.M. Sheideman discussed with the Commander-in-chief armed forces of Republic the first problems in preparation of the Red Army for offensive chemical war. One of them sounded so: "To pay attention intelligence section of the Staff of the Red Army to necessity of the strengthened collecting of data concerning fighting application of chemical means in foreign armies"<sup>63</sup>. Soon it has addressed with the letter directly in the Intelligence department. Questions were concrete: "Industrial way of manufacturing" of mustard gas and diphenylchloroarsine, check of data on creation in the USA chemical warfare agent in 70 times of more toxic, than were applied in the World War I, "the design of German gas mines and mortars"... That demarche has not passed not noticed, and on July, 1st, 1922 Y.M. Sheideman has received from deputy chief of Intelligence department J.K.Berzin the positive answer ("Intelligence department Staff of the Red Army... considers quite possible realization of all stated wishes as they cover Intelligence department")<sup>690</sup>.

Then at session Interdepartmental meeting on chemical means of struggle the report of representative Intelligence department about the condition of military-chemical art on May, 22nd, 1923 has been discussed<sup>440</sup>. As it has appeared, in foreign countries the industry of dyes (a serious source chemical warfare agents) especially strongly develops. By way of the future interaction it has been decided to prepare for Intelligence department of Red Army the program of prospecting search so that work in interests of military-chemical service has got regular character. Following report of Intelligence department Interdepartmental meeting on chemical means of struggle has heard on December, 1st, 1923 - the problem of new chemical warfare agents was discussed<sup>684</sup>. And already on March, 15th, 1924 professor E.I. Spitalskij has presented in Interdepartmental meeting on chemical means of struggle reaction on received from Intelligence department the information. It has been decided "to develop a note of instructions, than should be guided Intelligence department at getting literature Interdepartmental meeting on chemical means of struggle"<sup>685</sup>.

On a field of military-chemical investigation employees of embassy of the USSR in one of the few then friendly countries - Germany were especially active. In particular, one of problems 1925 was extraction of data about a German novelty - aircraft spray tanks for dispersion of chemical warfare agents from planes. It had been borrowed the military attache of the USSR in Germany I.M. Fishman, and soon it has received a post of the chief of the controls created in the Red Army Military Chemical Directorate. At

once after I.M. Fishman has held this post, in January, 1926 intelligence service the task "has been given to deliver drawings and the description German fragmentary-chemical shells, applied the German artillery per 1916-1918"<sup>690</sup>. It was a question of an ammunition with filling of diphenylchloroarsine and usual mustard gas.

In some years chief Scientific-Technical committee of Military Chemical Directorate P.G.Sergeev formulated ordinarier needs. We shall specify problems which decision required Scientific-Technical committee in 1929 and about what requested Intelligence department: "15. Recipes of mixes chemical warfare agents, left on a peace time (for equipment in a mobilization stock), and what on military time; 16. What ways of isolation chemical warfare agents from metal of the case of a shell now find of themselves application and for what chemical warfare agents;.. 18. What mustard gas is applied to equipment in a mobilization stock, that is on what way it is made, to what specifications should satisfy..; 21. What specifications on chemical warfare agents and on equipment (shells, aerobombs and other devices) exist;.. 23. Instructions on storing and transportation chemical warfare agents and artillery chemical shells; 24. Whether it is splitted up adamsite and what methods of its crushing..."<sup>688</sup>. As it is visible, very prosaic things were not clear, and skilled chemists of pre-revolutionary times perhaps could answer them if them would not start to leave within the limits of widely developed struggle against "wreckers"<sup>394</sup>.

And in following year tasks were so plain. Anyway in 1930 director Institute of chemical defense of the Red Army requested such prospecting data: "4. Recipes of tight putties for a groove of chemical shells;.. 6. Measures on stabilization mustard gas in artillery chemical shells;.. 18. Ways of protection of planes and pilots from pollution... chemical warfare agents;.. 26. Drawings and descriptions of various ground devices for contamination; 27. Drawings and descriptions of various sprays;.. 32. Ways of formation of additional pressure in devices..."<sup>689</sup>.

However, there were at the Soviet military chemists also more serious interests: system of arms aviation chemical bombs in the USA, England, France, Italy; the list of chemical warfare agents, accepted in 1928-1929 on arms of foreign armies; sights of foreign armies at ways of fighting application hydrogen cyanide and the reached results on weighting aerosol hydrogen cyanide; position of a question on fighting application of the substances allocating carbon oxide, hydrogen cyanide and arsine (AsH<sub>3</sub>); lewisite - a factory method of production and ways storing; alkaloids - prospective ways of fighting application; a technique of conducting tests in public irritating and generally toxic agents...; structure poisonous-smoky mixes; a manufacturing of poisonous-smoky mixes.

And in 1931 Military Chemical Directorate of Red Army it has been interested in reception of the detailed information. In the autumn 1931, for example, the number of the tasks transferred Intelligence department of the Staff of Red Army, included the following: "the decision of a problem liquid and hard mustard gas... the problem of winter mustard gas... the basic technological ways of production of the most important chemical warfare agents (mustard gas, arsines, hydrogen cyanide)... designs and fighting data of existing tank-tracks for contamination,.. application chemical warfare agents for the purposes fog- and smoke-generation in poisonous-smoky candles, use new chemical warfare agents and chemical warfare agents vesicant actions for these purposes in candles,.. drawings and the description artillery chemical shells time-fuse actions, the information on a direction of works with fragmentary-chemical artillery shells and methods of their equipment..."<sup>692</sup>.

In the further prospecting work on chemical weapon became constant and very versatile. The Soviet prospecting centers have abroad got qualified personnel and have established extensive communications. And they extracted everything, that was required Military Chemical Directorate, and even it is more. So, that in 1930 Military Chemical Directorate has been scarified by the high checking commission that, on the one hand, "in the chemical attitude our Red Army considerably concedes to the Polish army", and on the other hand for obvious non-use of data intelligence service ("Some rather important materials in the military chemistry, sent Intelligence department the Staff of Red Army to Military Chemical Directorate, not only have not been used Military Chemical Directorate, but by it are simply forgotten ")<sup>465</sup>.

This Criticism had consequences. Anyway on September, 30th, 1931 at meeting at the deputy chief of arms of Red Army representatives Scientific-Technical committee various managements, including Military Chemical Directorate, reported on use of prospecting materials of the Staff of Red Army<sup>691</sup>. In the further these meetings became monthly, and Military Chemical Directorate began to report about perusal of the received materials<sup>693</sup>.

Certainly, problems varied depending on change of political seasons, however interest at intelligence service was on all azimuths - both to the East, and to the West. So, in June, 1933 the meeting at chief Military Chemical Directorate has decided to give task Intelligence department the Staff of Red Army concerning search in east direction as the conflict on China-East railway then yet has not ended. Tasks concerning Japan were considerable: "To find out industrial and raw opportunities on arsenic; how many, what and where there are the plants producing chemical warfare agents; to get drawings and the

description of a chemical land mine; to define purpose chemical tanks...; to find out organizational structure of military units which apply fighting chemical machines; to find out, whether application non-persistent chemical warfare agents from air is supposed; to find out organization of Chemical Troops and a degree of saturation by them armies<sup>690</sup>. The task has been executed, and soon chief Military Chemical Directorate reported people's commissar for defense K.I. Voroshilov the first results<sup>696</sup>. On raw material the industry of Japan as if was ahead of the Soviet industry: on chlorine - capacity 100 000 tonnes/year (in the USSR - 60 000 tonnes), on sulfur - 100 000 tonnes (in the USSR - approximately 14 000 tonnes), on arsenic - 4 300 tonnes (in the USSR - 1 200 tonnes). On arms of Japan then were hydrogen cyanide, lewisite, and also mustard gas which as if has been reserved 10 000 t (at Far East army it for that moment was 300 tonnes). And on last maneuvers the army of Japan, according to Intelligence department, as if "widely applied chemical means: aircraft spray tanks, artillery chemical shells, devices for contamination districts and for gas releases".

In November, 1933 Intelligence department has received from Military Chemical Directorate tasks on the near West to the USSR: "what chemical armies... the Romanian army has...; what chemical arms of aircraft, whether there are devices for dispersion of chemical warfare agents by plane, what these devices; what chemical warfare agents consist on arms of the Romanian army, their mobilization stocks, a production potentialities of the industry (quantity chemical warfare agents and at what factories)... ". Interest to chemical affairs in the Romanian army did not weaken and later. However in February, 1934 at Intelligence department not found out Japanese secrets were requested, in particular, "what mustard gas Japan in winter conditions assumes to apply", and also "formulaes... viscous mustard gas, available in Japan"<sup>690</sup>.

We shall emphasize, that attitudes between two managements - chemical and prospecting - were bilateral enough. Military Chemical Directorate not only gave the task intelligence service, but also informed on results of the works executed from submission intelligence service that allowed it to judge efficiency of the work. By way of an example we shall result the letter which in March, 1932 has come from Scientific-Technical committee Military Chemical Directorate in Intelligence department Red Army and which the exotic problem concerned decisions enough. In it the following was written: "...On the basis of your instructions of 1-st plant has already lead work on synthesis of bromic analogues of lewisite which will be tested for toxic action in Institute of chemical defense. Synthesis of individual compounds proceeds..."<sup>690</sup>.

It is necessary to add, that the management of army not only extracted data on foreign military-chemical achievements, but also on a regular basis compared with them the Soviet data. In particular, such comparisons have been executed in 1932<sup>694</sup> and 1933<sup>687</sup>. Naturally, achievements of Red Army were compared to data on the most powerful military machines of those years - the USA, Germany, Japan, Italy.

In 1935 Military Chemical Directorate wished to learn on line Intelligence department interesting things: technology of production nonfreezing mustard gas from cracking-gases (it was necessary for reconnoitering in Germany), methods production hydrogen cyanide by synthesis from elements in a gas phase (to find out in the USA), a method production N-mustard from triethanolamine (to reconnoiter to Italy and the USA), an estimation carbonyls of iron as chemical warfare agents (to learn in Japan and Germany). And still Military Chemical Directorate last data on extraction of arsenic in Japan, USA and Germany were very necessary. Especially them the data, a concerning technology of catching of arsenic from departing gases interested. And the chief of arms M.N. Tukhachevskij has personally brought in task Intelligence department such uneasy problems, as search of works on ignition respirators by means of chemical warfare agents, and also on ways of creation of very high concentration chemical warfare agents<sup>690</sup>. And the special emphasis in the prospecting task 1935 has been made on chemical arms of aircraft - all world highly appreciated ability of this kind of technics to throw chemical warfare agents aside the opponent.

Certainly, chemical war of Italy in Ethiopia in 1935-1936 and other similar events has not passed by Soviet intelligence service.

It is necessary to emphasize, that interest has been connected not only with rout of the staff Soviet intelligence service in 1936-1938. It was more important that unsuccessful from the point of view of the chemical weapon war with Finland has induced a management of Red Army and the country is more critical to concern to experience of twenty years' preparation for offensive chemical war in 1919-1939. It has been formulated in one of documents 1940: "To ascertain weak work of prospecting bodies on getting the information about a condition of means of chemical arms, especially on chemical warfare agents, in foreign armies. Intelligence department red Army to consider as one of the main problems investigation of recipes new chemical warfare agents". Anyway in November, 1940 of the Air Forces of Red Army data about "chemical affairs" in the Air Forces of the broad audience of the countries (Germany, Italy, USA, England and Japan) requested in Intelligence department. First of all them interested consisting on arms

chemical warfare agents and chemical arms of aircraft<sup>690</sup>.

It is necessary to emphasize also, that in connection with a political tension in the East of the country the Soviet military chemists very much were interested in achievements of army of Japan<sup>695</sup>.

Passing to war and post-war affairs, we shall note, that these business were not too bad. Certainly, data about development in Germany such phosphorous organic chemical warfare agents as tabun, sarin and soman have got to Soviet Union at early stages. With it, among other, serious prospecting operation on capture military-chemical plants Germany has been connected<sup>428</sup>. Today is not a secret the destiny of the German stocks phosphorous organic chemical warfare agents. The fact of transportation trophy sarin in capacities both in the USSR, and in the USA in essence is already recognized by all. That on arms of German army 9 types fragmentary-chemical artillery shells and mines, including with sarin consisted is known also.

And subsequently Soviet intelligence service provided the Soviet Army and in general military-chemical complex with the newest information on the chemical weapon.

One of achievements of Soviet intelligence in post-war years was extraction of foreign data about new phosphorous organic chemical warfare agents type of V-gases. It managed to learn about O-ethyl-S-2-(diisopropylaminoethyl)methyl phosphonothiolate (substance VM on classification of V-gases<sup>7</sup>) as a vivid example chemical warfare agents the newest type at the earliest stages, and this information has appeared in GSNII-403 (Moscow)<sup>716</sup>. There, in present GSNIIOKhT, in November, 1957 there have been begun works on aminoalkylphosphonothiolates. And to 1960 there with participation of experts of Soviet Army (Military-chemical Academy, and also Central research military-technical institute) it has been received and surveyed about 350 candidates in new phosphorous organic chemical warfare agents 19 various types. From them 20 substances have appeared especially toxic, and one of these substances (O-isobutyl-S-2-(diethylaminoethyl)methyl phosphonothiolate, become by the Soviet V-gas)<sup>203,716</sup> - structurally only slightly differed from initial chemical warfare agents, created in the West, and on toxic properties surpassed all known in a military-chemical underground chemical warfare agents. This success has come to the end with the organization in the USSR experimental, and in the further scale industrial production of Soviet V-gas. However the Lenin premium<sup>716</sup> to receive then it was not possible - plagiarism was too obvious. It have given out much later - for the organization industrial production of a chemical ammunition on the basis of the Soviet V-gas, and absolutely to other command of people<sup>717</sup>.

The next successes of Soviet intelligence service have been connected with extraction in the West of the information on set of others chemical warfare agents, in particular nonlethal type. In particular, about "drug" LSD and about gas CS. That information has served for Soviet military-chemical complex as the basis at the organization of manufactures: experimental production of LSD - in Volsk-Shikhany, industrial production of CS - in Novocheboksarsk, etc.<sup>44</sup>.

## **2.2. GREATER GERMAN CHEMISTRY**

The Union of two countries-derelicts - the USSR and Germany - has developed after the World War I and many years have existed. About this union it is written much. We shall be limited to only military-chemical party of attitudes of the USSR with Germany which has been mentioned by historians less the than the others and which has passed some stages.

At the first stage it was supposed to organize cooperation in the field of the chemical weapon - industrial, military and even, probably, scientific. A legal ground for it became signing on April, 16th, 1922 in Rapallo (Italy) treaty between Soviet Russia and Germany about restoration of diplomatic relations, mutual refusal of claims, and also about the beginning of trade and economic relations. Consequence of the general political treaty became rendering of the help of Germany by Russia in overcoming the interdictions imposed on it by the Versailles contract after defeat in the World War I. Interdictions extended on the major for militarists of area, including the chemical weapon.

The Corresponding military arrangement has appeared immediately. It was the state secret of the highest rank, and its sources had only bosses of the country. On August, 11th, 1922 between Reichswehr and the Red Army the temporal agreement on cooperation has been signed. According to it Reichswehr has started to create in the Soviet territory military objects for carrying out of tests of arms, including the chemical weapon, and also for training staff of arms of the service, which Germany were forbidden for having Versailles treaty<sup>53,718</sup>. In 1923 on a line of industrial cooperation at production chemical warfare agents, including concrete decisions have been made on joint construction in territory of the USSR plant on production of two basic chemical warfare agents of the World War I - mustard gas and phosgene<sup>668</sup>. The teamwork connected with tests of new samples of the chemical weapon have soon begun. And on a boundary of 1920-1930th attempts to adjust scientific cooperation in search of new types chemical warfare agents have begun also. Success of these projects was various, however really productive for the cooperating parties there was only military-chemical cooperation while scientific cooperation in essence

has not begun.

**Industrial cooperation with Germany** in the field of the chemical weapon developed in 1923-1927<sup>667,668</sup>. Its marks are those.

On May, 14th, 1923 the contract between the USSR and Germany about the organization at station Ivashchenkovo (this settlement then was called the city of Trotsk, nowadays is the city of Chapaevsk, Samara oblast) on chemical plant Ushkov the production of chemical warfare agents and also installations on filling them in artillery shells has been signed. From Germany on behalf of Reichswehr a technological part has taken up concern Hugo Stolzenberg<sup>667</sup>. As consequence of that decision on September, 30th, 1923 has been signed the constituent contract about creation in territory of the USSR of the mixed Soviet-German joint-stock company "Bersol". The purpose - the organization production of mustard gas and phosgene for satisfaction of needs of both countries. The organization production of peace production (sulphur acid, caustic soda, etc.) was provided also, and in its text on this account it was unambiguously specified, that such work will be conducted only "with a view of conspiracy"<sup>668</sup>. As founders of joint-stock company have acted: from the German party - Gesellschaft zur Foerderung gewerblicher Unternehmungen, from the Soviet party - society "Metahim" (both organizations - false). The basic contribution of the Soviet party to the general capital of joint-stock company became delivery in concession for 20 years chemical plant. Since 1919 this chemical plant has been nationalized and was in charge of Supreme council national economy of the USSR. Under the contract productivity chemical plant has been established very big: on mustard gas - 75000 poods/years, on phosgene - 60000 poods/years, on filling of artillery chemical shells - 500000 pieces/years on everyone chemical warfare agent<sup>668</sup>. Society Gesellschaft zur Foerderung gewerblicher Unternehmungen has undertaken to provide start of production of chemical warfare agents in short terms - not later on January, 1st, 1925.

Very much greater speed of works was set not vainly. Germany acquired the right to secret import from Soviet Union within three years: mustard gas - 5 500 poods/years, phosgene - 3 000 poods/years. Soviet Union has undertaken to provide an opportunity of duty-free import in the country of the technical equipment from Germany and export to Germany the chemical weapon ordered by her - mustard gas, phosgene and artillery chemical shells.

The Soviet-German cooperation in the field of the chemical weapon in 20th had strategic character. Therefore the top management of the country has been involved in it (the secretary general of Central Committee VKP(b) J.V. Stalin, chairman Revolutionary military council L.D. Trotskij, the head of the government A.I.Rykov, the people's commissar of foreign affairs G.V.Chicherin, vice-president Revolutionary military council I.S.Unshliht, the chief of the Air Forces A.P.Rozengolts) only. These people dealing with a problem of creation plant chemical warfare agents extremely actively. Moreover, for realization of the project the Special commission of the Political bureau of Central Committee VKP(b) has been appointed which possessed unlimited powers. The chapter of the Special commission became I.S.Unshliht - the representative of a cohort of the old bolsheviks, enjoyed confidence J.V. Stalin and held consistently posts of vice-president All-Russian Special Commission for Combating Counter-revolution and Sabotage, vice-president Revolutionary military council the USSR and vice-president Supreme council national economy the USSR.

German money, apparently, did not suffice, and means were necessary and on own foreign purchases. Anyway on May, 25th, 1924 Revolutionary military council under presidency L.D. Trotskij has found time for allocation of currency money for purchases abroad things very necessary to army, "first of all on artillery and military-chemical needs"<sup>87</sup>.

The life, however, has disposed in such a manner that the Soviet-German cooperation in the field of production of the chemical weapon has not ended with anything. It is known, that in 1924 the Soviet industry has accepted the order for manufacturing for Reichswehr 400 thousand artillery shells<sup>718</sup>. In 1926 the order has been executed, however this fact has not escaped attention of the "interested" countries. And the same year the English newspaper "Manchester guardian" has begun a series of the exposures, concerned the Soviet-German cooperation. One of the first messages concerned to deliveries from the USSR to Germany artillery shells on a line joint-stock company "Metahim". The scandal, ended has burst in resignation of the government of Germany. The situation obviously developed so, that the press learns also about preparation industrial production the same joint-stock company "Metahim" mustard gas and phosgene under the order of the German army-derelict. As a whole the western press of those years has got in a sore point. Besides by "trial and error method" it has been found out, that concern Hugo Stolzenberg had no the serious "know-how" mustard gas, and the German party foreknew about it. And at any stage it have understood not only experts, but also security officers. As it has appeared, during manufacture "there will be very much greater losses outside phosgene which will poison surrounding district". And with mustard gas business were worse than ever: "Constant running off liquid "Ö" [mustard gas] in ground and its congestion in it with a unconditional opportunity of hit in the river that is unsafe for the surrounding population, and for neutralization "Ö" is not stipulated any adaptations"<sup>668</sup>. Besides in the

spring 1926 the territory of a plant has been flooded by the spread Volga. In general to hide secret of forbidden cooperation with Germany in military tests of the chemical weapon, the Soviet party has been compelled to head for break of cooperation in the field of its industrial production.

On May, 12th, 1926 the Special commission of the Political bureau of Central Committee VKP(b) has solved "in view of default by the German party of the obligations under the constituent contract" about creation plant on production of mustard gas and phosgene in Ivashchenkovo (Trotsk) to head for independent expansion of works, in particular "to start construction of another plant independently without Germans" (actually another plant has already been created, and the German party did not know about it absolutely anything). On June, 30th, 1926 the Special commission of the Political bureau has once again confirmed a line on break with Germans and continuation of works on the organization of the industry chemical warfare agents only by own strength<sup>668</sup>.

Soviet military-chemical plans thus could not occur - by then professor E.I. Spitalskij has already solved the basic questions of designing of plants on production of mustard gas and phosgene by own strength<sup>370</sup>.

The Next decision of the Political bureau of Central Committee VKP (b) on this theme, accepted on January, 13th, 1927, has established, that the Soviet-German contract is considered stopped. The rest was a trick. Was plant Ushkov has been withdrawn from doubtful joint-stock company and it is returned in Supreme council national economy. As to full reorganization of all manufacture chemical warfare agents this problem began to be solved more intensively. Since 1927 chemical plant at Chapaevsk has continued the military-chemical life already under plans of the Soviet militarians<sup>668</sup>.

Use of German experience by preparation for chemical war was carried out those years in all directions. In the end of 20th, alongside with normal work intelligence service, trips of the Soviet military and industrial experts to the countries, possessed the greatest achievements in the field of chemical war have begun. Certainly, first of all it was Germany. However trips also in other countries (USA, France, Italy, etc) were carried out.

January-February, 1929 Germany was visited by group of the Soviet military-chemical experts. The purpose - "to familiarize with official data about a condition military-chemical art, having found out in passing a number of special problems". The first conversation with the chief intelligence service general Blomberg has shown, that Reichswehr is not going to hide the achievements from "friends". The certificate of it is the list of places which were visited by the Soviet experts: laboratory professor Flury in Pharmacological institute of university in a Wurzburg, institute of the gas analysis of professor Wirt at Berlin high technical school, anti-gas laboratory of dr. Vajn in Spandau Citadel, technological laboratory of dr. Obermiller in a chemical-technological institute in Charlottenburg, anti-gas school in Ìããè (Berlin), chemical works on range in Kummersdorf, factory of means of protection in Oranienburg, factory of means of chemical protection in Lubbecke, firm in Kiel (production of devices for terrain contamination, chemical grenades, etc.)<sup>667,675</sup>. During conversations with management Reichswehr and experts members of the Soviet group have received direct answers to many questions. Anyway professor Flury did not hide the attitude to much (that "in the future war lewisite will not present special value", that from arsines the most valuable is diphenylcyanoarsine, that adamsite "till now are not able to apply", that to try to apply carbon oxide and arsine (AsH<sub>3</sub>) as chemical warfare agents it is not meaningful, that new chemical warfare agents in Germany is not present). General Ludwig did not hide the negative attitude to storing mustard gas in a mobilization stock, believing, that is necessary to store not mustard gas, and raw material for its production (thiodiglycol)<sup>667,675</sup>.

It is necessary to emphasize, that loan of another's experience occurred in parallel to loss of own experience. Anyway after in the industry of the USSR per 1929-1930 "rout of wreckers" has been carried out<sup>394</sup>, just right was to start to think how to compensate its consequences. It is not surprising, that there should be a question on attraction of "chemical minds" from other countries instead of lost (instead of academicians-chemists V.N. Ipatieff and A.E.Chichibabin which have left the country, instead of the member of the Academy of sciences of the USSR E.I. Spitalskij stirred up in chemical prison, instead of disappeared professor A.A. Dzerzhkovich, etc.).

At that stage it was supposed, that in special laboratory three known experts in the field of chemistry and toxicology chemical warfare agents - professors Meyer, Willand and Flury will work. However this initiative has remained only a wish though the Red Army during subsequent time also did not stop attempts to involve in itself of professors from Germany<sup>670</sup>. In 1931 there was an idea about application of experience of German military chemist Zihrer which was known on work in the USSR on proving ground in Shikhany, for creation of Soviet viscous mustard gas<sup>670</sup>. It was supposed to charge to it - to one of employees professor Wirt - creation of two compoundings: for use in a chemical ammunition (shells, bombs, mines, land mines) and for a pouring out from tankers and aircraft spray tanks. And this initiative has ended with anything.

In the Autumn 1931 has visited Germany high-ranking head Military Chemical Directorate. It has

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received the necessary information about chemical warfare agents (mustard gas, ethyldichloroarsine, diphosgene, phosgene, Adamsite, chloroacetophenone - individually and in mixtures; by the way, hydrogen cyanide, Lewisite and carbon oxide perspective in Germany did not consider), and also about means of a chemical attack of Reichswehr (tanks for contamination, chemical land mines, aircraft spray tanks, gas projectors, artillery chemical shells). As it has appeared, these means have been tested on proving ground in Shikhany and were well-known in the Red Army.

1933 was significant not only the end of military-chemical cooperation with Germany. Parting with German military-chemical experts, whose lessons, in opinion I.M. Fishman, have ceased to be necessary, was accompanied by attempts to entice to Soviet Union on a permanent job of the founder and the chapter of school of chemical war of Germany of professor F. Haber. Though intelligence the West believed, that F. Haber as if taught military chemistry in Soviet Union in 1932<sup>34</sup>, actually hardly attempt entice it could to terminate in success. As some years before the scientific chapter of the Russian military-chemical school academician V.N. Ipatieff has been compelled to leave the country<sup>59</sup>. It has appeared absolutely unnecessary the same I.M. Fishman.

### **2.3. FIGHTING FRIENDSHIP WITH PREDECESSORS OF HITLER**

Usually it is considered, that the fighting military-chemical friendship between the USSR and Germany has begun in 1928 and was territorially realized on Volga on military-chemical range at Shikhany<sup>34,36</sup>. Actually it not so - process of rapprochement and carrying out of teamwork has begun much earlier, and the range at Shikhany was preceded with ranges near Moscow and near Orenburg. And, unlike industrial, military cooperation in a chemical direction, developed more successfully, to mutual satisfaction of partners. Official negotiations about military aviation-chemical cooperation have begun in 1925.

On August, 21st, 1926 in Moscow the agreement on the beginning German-Soviet "gas experiments" has been signed. The concept was simple: in Germany to carry out laboratory and theoretical works, and the large-scale military-chemical tests which are a subject prohibition and the international control, - near Moscow, in settlement Podosinki. Formally idea of the agreement has arisen as if during conversation of military ministers B. von Blomberg and K.I. Voroshilov, however actually the decision has accepted the Political bureau of Central Committee VKP(b). On behalf of authorities the agreement was signed by two military attaches: the former military attache of the USSR in Germany I.M. Fishman and operating representative Reichswehr of Germany in the USSR von der Lit-Tomsen<sup>667,669</sup>. Actually meant military-chemical proving ground in Kuzminki which existed 8 years. And Podosinki were settlement near proving ground which was between two railway stations - Lyubertsy and Uhtomskaya. Its name has arisen most likely by virtue of an immemorial habit of our militarists to use in correspondence not those settlements where there were real events. Actually in area Podosinki-Uhtomskaja there was only small air station, shortly before these events transferred Military Chemical Directorate for service of works on range in Kuzminki. And in Podosinki there were three country-cottages, allocated for habitation of German "visitors" ("friends"). All this operation has headed I.M. Fishman, and its maintenance outside of Military Chemical Directorate carried out Intelligence department of the Red Army<sup>5</sup>.

**Tests 1926** have been carried out in October-December. 43 flights on route Podosinki-Kuzminki-Podosinki have been accomplished and during these flights have been executed from various heights of a pouring out on range of the liquid simulated properties mustard gas (German mustard gas then in the USSR yet was not, and about existence Soviet mustard gas with "friends" have not shared). Experiences have proved, that a liquid which is poured out from heights down to 1000 m, reaches the ground without greater losses, and the greater area becomes covered by her (for example, 300 kg of the liquid which have been poured out from height of 400 m, cover the area approximately 100-120 thousand m<sup>2</sup>). Those results were so serious, that I.S. Unshliht has described them in letter J.V. Stalin directed by way of a New Year's greeting on December, 31st: "Experiences have proved a full opportunity of wide application chemical warfare agents by means of aircraft. Under the statement of our experts, on the basis of these experiences it is possible to consider established, that application mustard gas by means of aircraft against the alive purposes, for contamination districts and settlements - technically probably and is of great value. Since spring 1927 it is necessary to execute 2-nd phase of tests - to lead a pouring out from different heights mustard gas which it is supposed to prepare at us in February on a German method"<sup>669</sup>.

Soviet Military Chemical Directorate has received results of joint experiences, however it has not helped - German aircraft spray tank was not suitable for suspension on Soviet plane R-1. And already on November, 26th, 1926 in Chemical committee it was necessary to sit on a theme "about the project of the device for a pouring out liquid chemical warfare agents from the plane". It has been decided to make by December, 10th working drawings of the device for its installation by plane R-1. The further experiments assumed to conduct in following year with application of the real mustard gas, "prepared on the small

factory built on range" in Kuzminki. Experiments should find greater scales "in view of not only technics, but also tactics... Therefore the much greater area as 5-6 greater planes should work simultaneously is necessary, covering mustard gas greater spaces". So there was an idea to pass to the Luga artillery range, and in report I.M. Fishman, directed I.S. Unshliht, it was assumed - in case of success of experiences 1927 - "the organization joint with visitors of the big constant aerochemical range somewhere., where there is a big free space". The further events passed under the plan. German installation for production mustard gas on Meyer's method has really been delivered on chemical proving ground in Kuzminki and mounted (productivity of 350-400 kg a day). With use also the raw material (thiodiglycol) delivered from Germany in July, 1927 under direction of German experts some tonnes high-quality mustard gas have been prepared. Installation so has liked, that on representation I.M. Fishman people's commissar for defense ordered to redeem it. Then after long delays installation has appeared on plant 1 1 (Moscow) which experts in 1930 have made 6 tonnes mustard gas with using import thiodiglycol. After that negotiations which purpose was construction by forces of Germans of the whole plant for production in the USSR of mustard gas Meyer took place. However, unsuccessfully<sup>5,672</sup>.

However the joint Soviet-German test season 1927 which was necessary for leading within the limits of the first agreement, actually took place not in Luga, but on aviation range near Orenburg<sup>673</sup>. The season 1928 on specially created military-chemical range in Shikhany (Saratov oblast) has been carried out in frame of the new (second) agreement. After that military-chemical cooperation was carried out already within the limits of the third (this time five years) - the project "Tomka", also on range in Shikhany. The purpose of experiences 1927-1933 became joint test of the means created in Germany and methods of fighting application chemical warfare agents with use of aircraft, and also artillery and other ground means, including chemical land mines and special gas mortars.

**Tests 1927** have been executed to the south from Orenburg where in 9 km from city was available military aviation proving ground. Have lodged German militarists (a symbol - "visitors") in the Orenburg, and every day they went on military air station from which flights on range were made. As in 1927 the authority of the USSR was going to represent a figure of formal connection of the Soviet country to Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare<sup>55,686</sup>, covering has been thought up. Business was represented so as if the German command has arrived to Orenburg for work with "public organization" OSOaviachem at the decision of problems of pest control of an agriculture<sup>673</sup>.

For carrying out of experiments from Kuzminki three German planes have been thrown, one more plane Hejnel has arrived directly from Germany. German experts have prepared within winter 1926-1927 some novelties. Among aviation innovations were new type aircraft spray tank for contamination greater spaces with use mustard gas, and also remote aviation chemical bomb big calibre. That up to overland novelties they included the portable device for terrain contamination with use persistent chemical warfare agents, and also chemical land mines<sup>673</sup>. As reported in Revolutionary military council happy I.M. Fishman, it has stipulated at the German party the right to reception "on one or is a little bit exemplary" tested chemical arms. Germans were so are interested in teamwork that have delivered to chemical proving ground in Kuzminki even field installation for manufacture mustard gas for all field season. So experiments of 1927 on Orenburg aviation proving ground have been executed in high-quality German mustard gas<sup>673</sup>. The reason of it consist that, by I.M. Fishman, Germans "have no need to know that we already have lots mustard gas". And they have not learned.

During a **season of 1928** joint experiments with Germans have been executed already on specially allocated range in area of settlement Shikhany with the initial area 85 km<sup>2</sup>. This range for some years became a place of joint Soviet-German experiments. Then it has started to be used also for the Soviet tests of the chemical weapon<sup>163</sup>. Experiments, executed in 1928, included novelties. For example, the automobile tank in capacity 1000 kg for terrain contamination with use persistent chemical warfare agents (it allowed to contaminate a site in length 2700 m at width 2-30 m). Two manual devices for terrain contamination - by capacity 8 and 10 litre have been tested also, that allowed to contaminate the area 800-900 m<sup>2</sup>. These devices were interesting by a set of sprays. The next models aircraft spray tanks for watering chemical warfare agents from air, and also time-fuse aviation chemical bombs have been tested also. Especial interest of the Soviet military chemists has involved a chemical land mine in capacity 5 litre chemical warfare agents, undermined in air. At height of undermining up to 20 m this land mine allowed to contaminate the area up to 450 m<sup>2</sup>, and splinters thus scattered up to 75 m<sup>674</sup>.

Reporting before people's commissar for defense K.I. Voroshilov about the executed works, I.M. Fishman has informed, that a coming season, "should be **last** year our joint military-chemical work. In 1928/29 we shall receive from them the last still the important data for us technical character"<sup>674</sup>. The life has disposed, however, differently - with Germans new (already five years') contract has been concluded. The reason consisted that in August, 1928 teamwork in Shikhany was inspected by the German minister B.fon Blomberg. Scales of military-chemical achievements have liked it, so the question of financing of

works on range for some years forward has been solved. Specially for the visitor from Germany three tests have been shown: contamination a forest plot from manual devices, terrain contamination from the tank under pressure, bombing from height about 1000 m. Much in these methods of a chemical attack was for visitors from Reichswehr news.

The **season of 1930** proceeded from July, 17th, till January, 15th, 1931. It has begun so late because Military Chemical Directorate of the Red Army wished to finish on range own tests. Joint tests have been begun in the middle of August. Expedition of "visitors" included approximately 30 person and consisted of several groups - artillery, aviation, on devices for contamination, and also biological<sup>677</sup>.

It has been executed nearby 30 experiments which most part concerned to artillery firing practices, to aviation bombing and undermining of chemical land mines. Upon termination of tests already in Moscow final conference in which 5 "visitors" (heads of tests) participated, and also ranking officers Military Chemical Directorate on January, 19th took place<sup>677</sup>. Among basic experiments we shall specify studying important for the country possessing Siberia, so-called "winter mustard gas" as which has been used usual mustard gas with addition of 32% chlorobenzene. It gave even at -15--20°Ñ "greater toxic effect" in comparison with summery mustard gas. In this form mustard gas has been used by Germans even in World War II. However the Soviet military chemists have not understood sense of idea, though have opened trophy German shells with mustard gas in 1923.

During a season 1930-1931 the problem of a design of chemical land mines as which the German party considered as the convenient weapon for terrain contamination during retreat has been finally solved. The area contamination mustard gas for a land mine in capacity 5 litre was reached 100-150 m<sup>2</sup>. Questions storing land mines also were considered solved (high-quality German mustard gas in cases from German iron means)<sup>677</sup>.

Have been lead also firing practices from howitzer calibre 105 mm by various types of shells in filling of liquid mustard gas. Those experiments, however, have not given the final answer to a question on the size of a charge of an explosive, and them has been decided to continue in a following season.

At studying means of an aviation-chemical attack two groups of tests have been executed: with bombs and with aircraft spray tanks. Aviation chemical bombs percussion action have been tested with various explosive charges and with various volumes of mustard gas. The Soviet participants were especially impressed with the device, "by means of which time-fuse it is possible to establish in air during flight". These experiments have not been finished and have been transferred for a following season. Samples aircraft spray tanks, which "visitors" have brought with themselves, have been modernized during tests "mainly because of non-uniformity and a slowness of a pouring out" of mustard gas. The device which began to remind VAP-3, created by then the Soviet party secretly from "friends" has as a result turned out. By a following season Germans promised to bring the device still "more perfect design", and the Soviet party has already put on arms the VAP-4 (the manufacturer - a factory "Volcano", Leningrad). It happens secretly from Germans directly during joint tests - in December 1930<sup>677</sup>.

Among others we shall specify joint tests of automobile tank KRUPP for terrain contamination. At speed of 15-20 km/hours the width contamination 22-25 m was reached. Tests has been decided to continue.

On everyone experiment the German party made the report which one copy was transferred the Soviet party. The Soviet military chemists have received all samples of German military-chemical property - artillery chemical shells, aviation chemical bombs, aircraft spray tanks, manual devices for terrain contamination, 7 automobile tanks for terrain contamination, universal installation for pouring mustard gas and even the device for installation time-fuse aviation bombs during flight by the plane<sup>677</sup>. We shall specify also, that during a season 1930-1931 **joint Soviet-German test mustard gas on alive people took place**. The Soviet party has given to German chemists "7objects" on which leather drops of mustard gas were put.

The **Season of 1931** at Shikhany also was successful. "Visitors" in quantity 17 person worked since June on the beginning of November<sup>678</sup>. Directions were the same, as earlier - aircraft, ground devices, artillery, chemistry, toxicology...

For aviatests Germans have brought three new samples of aircraft spray tanks. One of them, capacity 170 litre, has especially liked the Soviet military chemists. It allowed from height 30-40 m to contaminate a strip in width 70-75 m and length 66 m, including viscous mustard gas. The contamination of the plane thus was not observed. The new remote bomb (capacity chemical warfare agents - 80 litre), intended dump down to height 4000 m, had a remote tube with a clockwork, and it "worked trouble-free". At break at height 100 m the area of contamination 1500-2600 m<sup>2</sup>, depending on speed of a wind was reached<sup>678</sup>.

During artillery chemical firing practices in the ravine picked up for these purposes were are tested artillery chemical shells various types. Accepting the parties have liked a technique of application "visitors" of shells in filling of diphosgene, and also shells with the knock out bottom. Remote shells as it

was found out, still demand completion. Addressing to a choice calibre "visitors" have found out the preference to larger, "giving a greater useful loading"<sup>678</sup>.

That year tests of the automobile tank for terrain contamination have been finished. The system brought by "visitors" sprayers has been tested, allowed to give large drops and greater density contamination<sup>678</sup>. Those sprayers have been bought and together with drawings of installation are transferred to factory "Promet" (Leningrad) for use at creation of Soviet fighting chemical machine BKHM-1. Machine BKHM-1 has been accepted Revolutionary military council on arms on February, 27th, 1932<sup>90</sup>.

Tests of a chemical land mine which samples differed from previous only details have been finished also<sup>678</sup>. Tests have been executed, among other, with a land mine in filling of viscous mustard gas. The area contamination - approximately 300 m<sup>2</sup>. The Soviet party has put land mine KhF-1 on arms already on February, 27th, 1932<sup>90</sup>.

"Visitors" have brought some kinds viscous mustard gas, and the some people have appeared especially "effective". Anyway the Red Army man who has smeared a hand so-called colophony mustard gas after its stay on district within 20 days, has received quite typical mustard gas defeat<sup>678</sup>. In general in the report it was fairly specified: " 1. Work with visitors in 1931 has brought to us doubtless advantage. Full use of achievements of visitors can promote considerably to improvement of our means of chemical struggle. 2. The further work with visitors in 1932 certainly **still is expedient** ".

Firstly plans for a season 1932 at Shikhany were quite positive. In February the German party has transferred the plan of works which included technical experiments and tactical tests. Numerous joint experiments have been included in the list of 100-day's technical works: check of a level of danger of sites, earlier contaminated by hard mustard gas, experiments with samples German hard and viscous mustard gas, artillery tests with use various chemical warfare agents (including hard, viscous and liquid mustard gases) and various designs artillery chemical shells, experiments with new types of air means of a chemical attack and various compoundings chemical warfare agents, and also a series of experiments on terrain contamination with use of the big and small fighting chemical machines (BKHM) and chemical land mines<sup>679</sup>.

However, per 1932-1933, alongside with desire to continue joint Soviet-German military-chemical works, at Military Chemical Directorate there were also other feelings. Mistrust of "friends" to each other was those years to constants. Anyway in internal documents of the Red Army all time was emphasized, that teamwork with Germany should provide " an opportunity of refusal of the further experiences when we shall find it necessary ".

The dissimilarity of the purposes was showed that the German party the plans of 1932 has connected a condition "participations in a monetary outlay of command of the Red Army". Gravity of this condition it was supported with the prevention, that at its default visitors will be compelled "to reduce considerably term of stay of German staff". The Soviet party on this account had reasons. Here believed, that the German army hides from "friends" new chemical warfare agents. During an exchange of arguments in reply to charge in concealment from the Soviet party of new types chemical warfare agents it has been specified, that "in Germany have encountered enormous scientific and technical difficulties and on small prospects under the invention of new substances owing to what the center of attention is transferred on development available chemical warfare agents, aspiring to increase in their action up to a maximum, finding new ways of their application". In general the army of Germany has taken a time-out for a year<sup>679</sup> (to pleasure I.M. Fishman, which all 1932 has devoted in essence to the first large-scale tests in Shikhany<sup>163,164</sup>).

For a **season of 1933** at Shikhany also it was planned much. Anyway on October, 9th, 1932 chief Military Chemical Directorate complained in Intelligence department of the Red Army, "that till now on a line military-chemical art full acquaintance us "friends" with their valid achievements takes place far not"<sup>679</sup>. It is necessary to list that interested I.M. Fishman then: "1. New vesicant (blister) agent, surpassing on fighting effect of usual mustard gas. 2. Compoundings of viscous mustard gas for land mines, artillery chemical shells, aviation chemical bombs, aircraft spray tanks and fighting chemical machines... 8. Artillery chemical shells with the knock out bottom. 9. Aircraft spray tanks, working under pressure as a result of chemical reaction".

During the negotiations which have followed soon with representatives of Germany I.M. Fishman has demanded representation already two new chemical warfare agents - stronger, than mustard gas, vesicant agent and stronger chemical warfare agent irritating action. Moreover, it has demanded "the organization in Germany solid laboratory on synthesis new chemical warfare agents with attraction of the most outstanding experts (to find new chemical warfare agents, it is necessary to search for them) and an assumption of our experts for work in this laboratory"<sup>679</sup>. To work in such frank style military chemists of Germany were not ready most likely, however they have tried to find the decision all the same to lead joint experiences 1933, but within the limits of the plans.

It is necessary to specify, that did not interest I.M. Fishman. It joint tactical tests did not interest ("we

can make it and without them"). And after successful own experiments 1932<sup>163,164</sup> it already interested the partners solved the questions, but not questions which interested it, I.M. Fishman, a little. And on May, 17th, 1933 in the letter to M.N. Tukhachevskij I.M. Fishman reported unequivocally: "I Consider inexpedient the admission "friends" on the central chemical range where they strongly stir to our work and conduct intelligence"<sup>679</sup>.

For break with Germans in a management of Red Army the intrigue has been played. After that the pretext has been formulated: "Considering given to "friends" the sanction..., to declare, that in general chemical range in Tomka since summer 1933 is closed, and all works on it, including works of Red Army, stop, as the governmental bodies surveyed its site, have found rather dangerous presence in Tomka range for the surrounding population and have suggested Red Army to transfer range to other place. Owing to what teamwork up to 1934 are impossible"<sup>679</sup>.

Have left "friends" without scandals. Germans have taken away from Shikhany a little, and they have left much<sup>679</sup>.

Actual refusal of military-chemical cooperation with Germany took place as a whole in natural term from the point of view of policy - in 1933. If to consider a problem in historical prospect, that, strictly speaking, each party has received everything, that wanted. The Red Army has received from Germany necessary subjects of military-chemical equipment (in particular, thickened mustard gas, aircraft spray tanks, chemical land mines, terrain contamination vehicles, a number of types of a chemical ammunition, a remote detonator for aviation bombs, portable terrain contamination devices, etc.) and has saved on it a lot of time and forces. Besides the Soviet military chemists had own achievements (specialized chemical tanks, an opportunity of application hydrogen cyanide from planes, etc.) which was not at other armies.

For Reichswehr the Soviet grounds for experiences already steel without need. After coming to power in Germany head of a national socialist working party conditions allowed to work already with any types of the weapon, and without any international control.

#### **2.4. ATTEMPT OF MILITARY FRIENDSHIP WITH MUSSOLINI**

Further have begun not unsuccessful attempts to change friends - instead of the future German nazis for already existing Italian fascists. However, it is necessary to mean, that the friendship of Soviet military-chemical complex with fascist Italy last not for long - only three years.

The First expedition of the Soviet military chemists to Italy took place between March, 19th and on April, 15th 1932<sup>680</sup>. Within the limits of the general attempt to find in the Europe opportunities for cooperation in military area the pair representatives of high rank Military Chemical Directorate has visited Italy. They have visited the chemical enterprises focused on war, however to greater (to research objects of the industry chemical warfare agents, and also to any military-chemical objects) them yet have not admitted. However the military-chemical head of Italy general Malteze all the same has found time for conversation with the Soviet visitors.

During visiting plant at Chezano-Moderno (it is the station Sevezo) visitors have familiarized with production of chlorine and of candles of a poisonous smoke on the basis of chloroacetophenone (but manufactures diphenylchloroarsine and adamsite have not shown them). At visiting plant at Chenchio (in mountains in 30 km from the city Savona) it was possible to examine production of chlorine. It was possible to see on plant in mountains at Bussi a little bit more (it is the station Populi in 50 km from the city Pescara). There visitors have familiarized with absolutely still new productions of mustard gas and phosgene, have seen workshops not begun production of diphenylchloroarsine, and also have examined manufactures of chlorine and  $SbCl_5$ . And on a chemical plant at Naples "Cellulose-chlorine-soda" they have examined productions of chlorine, phosgene and diphosgene.

After visit per 1932 the Soviet visitors have drawn a conclusion, that "problems of military-chemical art in Italy take a thorough place in a number of means of arms of army"<sup>680</sup>. They also have seen that these problems are solved on wide front - in research work, in technological area and in the field of development of means of a chemical attack and protection.

Has passed not so a lot of time as similar visits have received more favorable continuation. On September, 2nd, 1933 under the initiative of the head of fascist Italy of B.Mussolini in Rome the Soviet-Italian nonaggression pact and a mutual neutrality has been signed. And at once development of contacts of two countries and especially armies on different lines has begun. From the beginning 1934 between armies of the USSR and Italy there was a brisk correspondence about an exchange of visits of military-chemical missions. The arrived delegation from Italy was headed by the chief of military-chemical service general Rikketti (from June, 5th till July, 3rd, 1934)<sup>681</sup>. Reciprocal visit to Italy has headed I.M. Fishman (from July, 10th till August, 4th)<sup>682</sup>.

Mutual military-chemical displays were frank.

Italians have visited the plants of the chemical weapon (at Stalinogorsk and at Ugreshje-Moscow), and also the military-chemical academy. Them even have acquainted with technology of production of

mustard gas though because of employment a trip to Chapaevsk on the plant <sup>1</sup> 102 did not take place. Were limited only to display of drawings in Moscow (and thank God - after shock watches on april-may production of mustard gas workshop at Chapaevsk were in essence in ruins). Visitors have been acquainted with models of the Soviet chemical weapon and tactics of its application on chemical proving ground in Kuzminki near Moscow. In the end of visit they were accepted by the assistant people's commissar for defense M.N. Tukhachevskij<sup>681</sup>.

Delegation of I.M. Fishman also has seen much, and it was accepted personally by the head of Italy. And during this meeting I.M. Fishman and B.Mussolini talked about details of the maintenance of visit in Italian. The Soviet delegation could observe much more, than two years ago - terrain chemical contamination on range in Chivitta-Veccia (70 km from Rome), a pouring out chemical warfare agents from planes in air station Mantechelio near Rome, greater tactical maneuvers in Abbrucci (where has familiarized with chemical actions of aircraft). Besides, the delegation has visited in Spetsii where has familiarized with chemical means of a marine sea fleet, and also has examined plant for production the chemical weapon in Bussi where has studied the technology of production phosgene, mustard gas and diphenylchloroarsine<sup>682</sup>.

Upon termination of visit of group I.M. Fishman to Italy heads of both military-chemical services have formulated the project of offers on the further cooperation in military-chemical area. It contained many serious ideas, in particular, an exchange of greater parties of technical mustard gas (on 350 kg) and diphenylchloroarsine (on 100 kg), and also transfer from Soviet Union to Italy of 100 kg technical adamsite. Besides it planned to exchange lists of the basic research works of the parties on military-chemical art, technologies production of separate chemical warfare agents, materials on downturn of temperature of freezing mustard gas, etc. (only 19 items). However, all these plans the sad destiny expected. General Rikketti has quickly enough coordinated offers of the parties with a management of the Military ministry of Italy. However at I.M. Fishman business with ratification was not took. In general further "friendship" with Italy at the Soviet military chemists on it has ended. It was then much more convenient to separate from the country which have made an attack to Abyssinia. And military-chemical a component was in that war 1935-1936 considerable.

However, all this did not prevent the Red Army to continue active military-chemical investigation in Italy. Anyway on 1935 Intelligence department of the Red Army has received on a line of military chemistry following orders (prepared in Military Chemical Directorate and approved M.N. Tukhachevskij): to find out, what chemical warfare agents are made in Chendgio on plant AKNA, to establish experimental manufactures chemical warfare agents, planned on pilot installations which were under construction at lake Viko in 150 km from Rome, to reconnoiter structure new irritating chemical warfare agents (its developer - military-chemical institute in Rome), etc.

The Natural end that "friendship" has come on June, 22nd, 1941

## **2.5. OTHER COUNTRIES**

We shall address, further, to some other countries.

Soviet Union has established diplomatic relations with the USA after Italy - on November, 16th, 1933. And in January-March, 1934 chief Military Chemical Directorate I.M. Fishman some times "worried" people's commissar for defense K.I. Voroshilov idea about such specific direction of cooperation with new friends, as construction in the Far East plant on production of chlorine. It marked, that "in case of favorable conditions it is possible to raise the question about construction by forces of the USA in the Far East plants for production chemical warfare agents"<sup>93,671</sup>. About the same it wrote K.I. Voroshilov in connection with an establishment of friendship with France. Attempt also has been made to be friends of China<sup>671</sup>. However special successes on these directions it has not been reached. Were at the Soviet militararians and other chemical-diplomatic contacts in 30th years.

In post-war years "the chemical friendship" basically extended on brothers on socialist camp. Accordingly, its shades changed in process of changes of the camp.

While the Soviet heads were in friendship with authorities of the Peoples Republic of China, depth of military-chemical mutual relations and other military attitudes was impressing. According to the decision of the Soviet government from July, 16th, 1957, in Moscow the wide exchange of opinions with military delegation of the Peoples Republic of China concerning the project of a long-term plan of development of a science and technics of the Peoples Republic of China took place. Clearly, that cooperation in the field of a military science and military technics, that is concerning the nuclear, rocket and chemical weapon meant first of all. Concerning a military-chemical component of cooperation with the Peoples Republic of China the decision of the Central Committee of the CPSU from June, 30th, 1958 was accepted. This decision had been established volume of the information transferred to the Chinese party during consultations between the USSR and the Peoples Republic of China on military-chemical questions. Consultations took place in July, 1958 and their substantial part on behalf of the Soviet Army

defined Chemical Troops and personally general I.F. Chukhnov. And for the State chemical committee the role of the assistant has been allocated. One of questions of consultations concerned maintenance production in the Peoples Republic of China the modern chemical weapon not only the first, but also the second generations. It was formulated so: "working off of technological schemes and modes on manufacture of the major chemical warfare agents (S-mustard, N-mustard, **sarin**, **soman**, hydrogen cyanide, etc.)". It is possible to be amazed, but other questions of the industry of the chemical weapon were discussed also many<sup>676</sup>. By the way, then in the Peoples Republic of China the greater party mustard gas which have been made in Dzerzhinsk specially for the Chinese friends has been transferred also. Subsequently the Central Committee of the CPSU has strongly regretted about those kind gestures.

Business was not settled only by needs of the Peoples Republic of China - technological know-how of hydrogen cyanide have been transferred then not only in the Peoples Republic of China, but also to Czechoslovakia, Poland, Hungary and Romania (with Romania attitudes of friendship at that time were still kept). However, in later years, even in days of sharp cooling attitudes, the Peoples Republic of China received from Soviet Union raw material for manufactures chemical warfare agents. Anyway the decision of the Soviet government from April, 20th, 1967 it was authorized to Ministry of Foreign Trade of the USSR to put in the Peoples Republic of China raw material which could be used for production hydrogen cyanide, - cyanic sodium and potassium cyanide<sup>676</sup>.

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*As a whole the Soviet intelligence service has gathered in the West many useful knowledge and experience concerning various types of chemical warfare agents and practice of their use with a view of conducting offensive operations. And the army of pre-war Germany has willingly shared the military-chemical achievements with the Red Army. As to use of experience of Germany in creation of the Soviet industry of chemical war hardly it can be named successful. Both post-war attempts of perception of such experience - voluntary after World War I, and compulsory after World War II - have passed to no small degree uselessly - not in a horse a forage.*

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