



Center for Strategic & International Studies
Georgetown University • Washington DC

June 12, 1986

JUN 16 1986

Mr. Matthew Meselson
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Dear Matt:

The next meeting of the study group on chemical warfare policy issues will be next Wednesday, June 18. We will meet again in room S120 of The Capitol, from 8:00 to 9:30 a.m. Our topic will be chemical weapons proliferation. I will make an opening presentation on the dimensions of the problem. John Hawes, Principal Deputy Assistant Secretary of State, Political-Military Affairs, will follow with a presentation on governmental responses.

Please note the following schedule change. We will not meet July 9, which was supposed to have been our next and last meeting. We will meet the following Wednesday, July 16, and again two weeks hence, on July 30. It might be prudent to block July 23 on your calendar since we may well want an additional day. One of these meetings will focus on future U.S. policy directions. The other will follow up previous discussion of the chemical weapons free zone and deployment issues.

Enclosed are a rapporteur's report on the meeting of June 4 as well as transcripts of the remarks made by Messrs. Kroesen and Meselson of two weeks ago. Our cochairmen asked that I circulate these, and the speakers agreed on the condition that I reiterate that these were informal remarks not intended for distribution.

We will telephone your office to confirm your attendance. Thank you for your interest and participation.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Brad Roberts', is written over the typed name.

Brad Roberts
Research Fellow

encl.

Comments by Matthew Meselson to study group May 21

I would like to begin with a few words about myself. I am a professor of biochemistry. I got interested in chemical weapons twenty-three years ago when I worked at the U.S. Arms Control and Disarmament Agency. I stayed interested and remained a consultant to various parts of the government. I am not any longer a consultant and I hold no clearances at present.

I came to certain conclusions which are general enough so that they can be stated simply. One is that it is contrary to United States interests for us to develop, have, or produce germ and toxin weapons. Anyone who wants to see careful detailed arguments on that should read the National Security Information Memoranda prepared for President Nixon in 1969 and 1970.

But we do need some chemical weapons. I do have different views from this Administration about what kind, how much, and where. My view about where is like General Kroesen's. You almost might as well not have them -- if you're talking about chemical artillery shells -- unless they are pre-deployed.

However, I have been asked to talk about deterrence. Obviously, deterrence, if we mean the threat of retaliation in kind, is only one of the possible factors acting to constrain the use of chemicals.

We know from historical records quite a lot about what influenced the no-gas policy that operated on both the Germans and the British in World War II. Now there were various levels

of policy, but I am talking about the military staff and command level. If you turn to the second page of my handout, you will see the declassified intelligence debriefing of General Herman Oschner, the commander of the German chemical troops in World War II. The constraints he describes are not based on the fear of retaliation.

"Gas was not considered a useful weapon compared to other munitions. In the attack on France it would have been relatively valueless to the fast panzer attacks. In the air attack on Britain it would not have been as effective as HE and incendiaries and would have added another item to production and supply. The use of gas in an invasion of Britain was not contemplated for one moment, but each unit would have been supplied with normal anti-gas protection against its possible use by the British. Gas was not contemplated for V weapons as it would have been less effective than HE."

Later General Oschner wrote a treatise for the U.S. Chemical Corps which is now declassified in which he said, now talking about the Russian front,

"For us, the premises were entirely different. Our intention was to shatter the Russian Front by means of swift powerful thrusts with our assault armies supported mainly by panthers and the Luftwaffe, then to envelope and annihilate entire army groups and to follow-up with a deep thrust into Russia in the direction of Moscow and the industrial centers. There the lifelines and the sources of Russian might were to be mortally struck. The use of chemical agents could only have reduced the speed of operations of this nature. Further, it would have strained to the breaking point our supply services."

On the other side of the channel, Winston Churchill repeatedly taxed his Joint Planning Staff with requests to find a way to make gas help the allies. Here is a typical response he got from his planning staff:

"The use of gas -- even employed continually and in large quantities against these sites [meaning the buzz bomb sites] -- all of which have not yet been located, would not be likely to have more than an harassing effect and we do not see any reason

why it should prevent a continued launching of Crossbow weapons. Provided the morale of the personnel of these sites remains high and their anti-gas training and equipment is adequate we do not believe that gas would do more than perhaps reduce the rate of firing projectors. Gas attacks are unlikely to be any more effective than bombing with HE in reducing the weight of the attack."

We also have several studies of the overall military effectiveness of gas on the Western Front in World War I. The Operations Research Office of Johns Hopkins conducted a study of the effectiveness of gas in WWI which is declassified now. It concluded that "In WWI toxic chemicals were not considered to be decisive weapons and did not prove to be so in themselves or in combination with high explosive fire except in local engagements." And the British Official History of WWI concludes as follows, "Gas achieved but local success. Nothing decisive. It made war uncomfortable, to no purpose." And Basil Liddell Hart, the British military historian, wrote "In the first it was the Germans' turn to find and misuse a new key to the trench deadlock. This was the introduction of gas. And unlike the British introduction of tanks later, the chance once forfeited never returned, owing to the relative ease of providing the antidote." This meant gas masks.

It is important to understand that the most effective gas in WWI was mustard gas. Unlike other WWI gases (and unlike any nerve gas) its vapor, at feasible concentrations, attacks the skin. Also, it causes blindness at very low doses. It was introduced in June 1917. Its use was, and many people don't realize this, essentially one-sided. By the time the Allies got

mustard gas, the war was essentially over. The Germans used thousands of tons of mustard gas. It had no decisive effect on military operations.

Does this mean that chemical weapons are useless? No, it does not. But neither the historical record nor the accumulated body of troop tests and field exercises under European conditions support the scenarios of chemical weapons effectiveness presented by General Kroesen.

What I am trying to do here is to set a context in which we look at these problems in a careful and analytical way. The chemical corps has been starved for almost 20 years for money to produce new chemical weapons. Their arguments sometimes have a quality that does not fit the facts and does not favor sound policy decisions. There is a danger that our thinking will be stampeded. We have to look at these things carefully and analytically.

Consider now a different part of the problem -- the Soviet threat. There has always been a lack of hard intelligence evidence. There has always been disagreement between intelligence analysts. Some come up with numbers less than our stockpiles. Some come up with numbers much larger. Intelligence analysts differ about whether the Soviets have used any lethal chemicals whatsoever in Afghanistan, and the evidence for the use of mycotoxins in Southeast Asia has collapsed.

Nevertheless, the Soviets do have nerve gas weapons and we cannot ignore that.

Now we come to the question of quantitative requirements. The way you figure out how much you need, say of chemical artillery rounds, has got little to do with how much the other side has. It would have something to do with it if you were planning to hit their chemical projectiles in mid-flight with your chemical projectiles. Then you would want to know how many they have so you could hit theirs in the sky -- that is silly. What you need to know to know how much you need is the number of chemical-lucrative targets, the rounds per target needed per day and the number of days of chemical war.

This is the kind of analysis that the Stoessel Commission presumably meant when it said that the Commission found that Department of Defence figures on what quantities of chemical munitions are needed to be "soft and uncertain," and that "More precise thinking and planning from the Department of Defence is needed."

Julian Robinson has recently published estimates of the U.S. chemical stockpile now in Germany. He states that there are about 435 tons of nerve agent in 155-mm and 8-inch artillery projectiles currently stored in West Germany. The Stoessel Commission reports them to be fully serviceable. That would add up to roughly 90,000 projectiles.

90,000 projectiles is not an inconsequential amount. With 1000 tubes firing an average of 100 rounds a day at 5-10% chemical -- that will provide a couple of weeks of chemical operations. In the overall context of European conventional and

nuclear scenarios, this was once considered adequate. The actual number needed is open for discussion and analysis.

I believe that chemical artillery shells are important to have. I believe it is important to have them in Germany. If we go through with the current plan of pulling them out in favor of a rapid deployment plan for binaries in a crisis, we are throwing away something valuable and not getting any quid pro quo for it from the Warsaw Pact.

Aside from artillery munitions, what other kinds of chemical weapons do we need? Maybe we need deepstrike. But I have not seen a persuasive scenario. And there are a lot of problems with Bigeye. VX is an over-rated agent. If you spray 1 gram of VX per square meter on troops wearing ordinary European theatre combat clothing plus a mask and hood, but no protective suit, you'll probably get only a few percent casualties and it will take hours before they happen. Bigeye puts down less than 1/10 of a gram of VX per square meter and the amount actually picked up by contact with personnel coming into the sprayed area will be even less.

One scenario that has been proposed for Bigeye is to slow down runway repair. With HE weapons you put holes in the adversary runway so he can't take off. Then his repair crews come out to fill up the holes so he can get the sorties going again. But Bigeye has come over and the crews have to wear protective gear and are slowed down, somewhat, but look at the trade-off. We are using our most precious high-priority air

assets to deliver Bigeye and some will be lost doing it. What does the other side do to offset it? They use more bulldozers. The trade-off is very highly unfavorable to us. There are lots of ways of limiting enemy air action over the battlefield. This particular scenario is a very wasteful one.

We may want some sort of deep strike capability, but only keyed to carefully thought out scenarios that have been critiqued by persons who are critical and tough-minded.

Let me now get to the anti-population warfare aspects of nerve gas operations. Soldiers can be made essentially invulnerable to chemicals. This is not so for HE and flame and certainly not for nuclear weapons. But you can make a soldier nearly invulnerable to chemical agents. It encumbers them to some degree.

But what about the civilians? If you can train civilians to wear masks, babies, old people, to get into shelters, to be disciplined when the alarm comes, most of them could be protected. Whether it is practical politically to do this in Europe, I do not know. It is not today.

Please turn to the last page of my handout. It shows the number of square kilometers made lethal to be in per ton of nerve agent GB released. This is for unprotected persons. I believe the calculations are conservative. If you will look at the planned acquisition quantities that Julian Robinson lists for the new 155 binary it is not 90,000, it is 1.2 million. That is not 435 tons of agent, that is more than 5000 tons. According to

Robinson, the planned acquisition quantity for Bigeye is 44,000, another 4,1000 tons of nerve agent. That is something like 100 chemical sorties every day, if the weather holds, for a month and a half. Those are the kinds of quantities that make tens of thousands, maybe hundreds of thousands of square kilometers of territory, lethal to be in unless you have chemical protection.

In conventional war civilians can to a large degree stay out of the line of fire. But they can't escape chemicals without equipment and training. Basements don't help. Down-wind drift poses very severe risks to civilians. It becomes an antipopulation war for Europeans.

My point is that we need some chemicals, but chemicals can also slip you into a nuclear war. And what kind of nuclear war? Possibly a very unplanned and uncontrolled one. One for which the stage is set by the unintended anti-population aspects of chemical war. It is important for both the Soviets and the U.S. to understand this because it doesn't matter much whose gas it is, only how much and how targeted.

I am concerned about the way we worry about this problem. It is the problem of the Americans to design, manufacture, and deploy chemical weapons. It is the problem of the Europeans, particularly the ones in the central part, to worry about the civilians. That is the way the responsibilities have been divided up. When you have two different groups of people worrying about problems that should be interdigitated and integrated in the most intimate fashion, that is where you have

the danger of falling in between the floorboards. We need to focus on this and I have never seen it done in a serious way.

Some have been told the policy goal is "get binaries." That is not the security of the United States, that is merely a weapon design. Get Binaries. That's the policy decision. Others want to "prevent binaries." It is a lot of blind men and a lot of elephants. So, I am worried, and I am worried about the breakdown of communications. And I am worried about what the ultimate consequences could be if we take the wrong steps.

CSIS CHEMICAL WARFARE STUDY GROUP
May 21, 1986

Questions for Discussion

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1. WHAT DETERRED CHEMICAL WARFARE IN WWII?

a) Protective postures

b) "Friction"

c) Threat of retaliation

2. WHAT CAN CHEMICALS DETER?

3. WHAT KIND? WHERE? HOW MUCH?

4. A WORST-CASE SCENARIO.

'INTERROGATION OF GEN. LT. OCHSNER'

Ochsner was General of Smoke Troops at OKH - 'One of the five Waffen Generalen under the Chef. Gen Stab. d.H.'

'The team are of the opinion as a result of the interrogation that the information given by the P.W. is substantially correct.'

'Hitler was violently opposed to gas warfare, partly because he himself was gassed in the last war. The strictest instructions were issued that no gas munitions should be taken outside the Reich (Bohemia and parts of Poland included) for fear of accidental use and to prevent capture in case of retreat. No pressure was needed to bring Hitler to these views which were entirely supported by Keitel and the General Staff. Gas munitions were never moved to the Russian front.

Gas was not considered a useful weapon compared to other munitions. In the attack on France it would have been relatively valueless to the fast Panzer attacks; in the air attack on Britain, it would not have been as effective as H.E. and incendiaries, and would have added another item to production and supply...

The use of gas in an invasion of Britain was not contemplated for one moment, but each unit would have been supplied with normal anti-gas protection against its possible use by the British.

Gas was not contemplated for V weapons as it would have been less effective than H.E.'

Gen. Lt. Herman Ochsner, January 1949

For us the premises were entirely different: our intention was to shatter the Russian front (if the Russians succeeded in establishing a front at all in the face of our sudden surprise attack) by means of swift, powerful thrusts with our assault armies, supported mainly by panzers and the Luftwaffe, then to envelop and annihilate entire army groups, and to follow up with a deep thrust into Russia in the direction of Moscow and the industrial centers. There the lifelines and the sources of Russia's might were to be mortally struck. The use of chemical agents could only have reduced the speed in operations of this nature; further, it would have strained to the breaking point our supply service, which was difficult enough anyhow in view of the poor railroad communications, the inadequacy of roads for modern motor transport, and the great distance from the German bases. We had to do everything possible to avoid this happening. Hence, under no circumstances did we dare commence the use of chemical agents. This applied equally to the opening stages of our 1941 campaign and to our offensive in the summer of 1942, which was planned along similar strategic lines.

Gen. Lt. Herman Ochsner
History of German Chemical Warfare
in WWII
U.S. Army Chemical Corps
Historical Office
January, 1949

"IN WWI TOXIC CHEMICALS WERE NOT CONSIDERED TO BE DECISIVE WEAPONS AND DID NOT PROVE TO BE SO IN THEMSELVES OR IN COMBINATION WITH HE FIRE, EXCEPT IN LOCAL ENGAGEMENTS. EVEN IN THESE, SUCCESS WAS USUALLY UNPREDICTABLE BECAUSE ENEMY PROTECTIVE CAPABILITIES COULD NOT BE FORETOLD; MOREOVER, WHEN MUSTARD WAS USED, ITS PERSISTENT ACTION AND DELAYED EFFECTS GAVE COMMANDERS OF EXPOSED UNITS THE CHOICE OF ACCEPTING CASUALTIES OR AVOIDING THEM BY EVACUATING."

---Dorothy K. Clark
Effectiveness of Chemical Weapons
in WWI, Operations Research Office
ORO-SP-88, Nov. 1959

"GAS ACHIEVED BUT LOCAL SUCCESS, NOTHING DECISIVE; IT MADE WAR UNCOMFORTABLE, TO NO PURPOSE."

---The British Official History
of WWI

"IN THE FIRST, IT WAS THE GERMANS' TURN TO FIND AND MISUSE A NEW KEY TO THE TRENCH DEADLOCK. THIS WAS THE INTRODUCTION OF GAS, AND, UNLIKE THE BRITISH INTRODUCTION OF TANKS LATER, THE CHANCE, ONCE FORFEITED, DID NOT RETURN, OWING TO THE RELATIVE EASE OF PROVIDING AN ANTIDOTE."


---Cpt. B.H. Lidell Hart, The Real
War 1914-1918, Little Brown, 1930

For SIPRI*
12 March 1986

J P Perry Robinson
Item 205/Rev.9

CHEMICAL AND BIOLOGICAL WARFARE DEVELOPMENTS: 1985

This preprint is being
circulated for information
and criticism. Comments
would be most gratefully
received.



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Table 5. US holdings of lethal chemical weapons: estimates from open sources

| Item | Number held | Short tons of chemical fill |
|---|---|-----------------------------|
| <u>Munitions now obsolete, deteriorated beyond repair or for weapons no longer in service</u> | | |
| 115-mm rockets | 480 000 | 2 500 |
| 155-mm gun rounds, landmines, leakers and unrepairables | 320 000 | 1 400 |
| <u>Bulk agent held for filling new or re-usable munitions</u> | | |
| 1-ton drums of non-persistent nerve agent GB | 5 700 | 4 300 |
| 1-ton drums of persistent nerve agent VX | 2 300 | 1 800 |
| 1-ton drums of mustard gas (persistent) | 14 000 | 12 600 |
| <u>Persistent-agent munitions for ground weapons</u> | | |
| For in-service but obsolescent weapons: | | |
| -- 4.2-in mortar rounds, mustard filled | 470 000 | 1 400 |
| -- 105-mm howitzer rounds, mustard filled | 480 000 | 700 |
| For modern in-service weapons: | | |
| -- 155-mm howitzer rounds, mustard filled | 300 000 | 1 700 |
| -- 155-mm and 8-in howitzer rounds, VX filled | 300 000 | 950 |
| <u>Nonpersistent-agent munitions for ground weapons</u> | | |
| For in-service but obsolescent weapons: | | |
| -- 105-mm howitzer rounds, GB filled | 900 000 | 750 |
| For modern in-service weapons: | | |
| -- 155-mm and 8-in howitzer rounds, GB filled | 200 000 | 850 |
| -- 155-mm howitzer rounds, binary GB | <u>Planned</u> ^b : 1200 000 ^a | 5 100 |

Table 5 (continued)

| Item | Number held | Short tons of chemical fill |
|---|--------------------------------------|-----------------------------|
| <u>Aircraft munitions</u> | | |
| For in-service but obsolescent weapons: | | |
| -- 2000-lb spraytanks, VX filled | 900 | 630 |
| For modern in-service weapons: | | |
| -- 500-lb and 750-lb bombs, GB filled | 13 000 | 1 300 |
| -- 500-lb spraybombs, binary VX | <u>Planned</u> ^b : 44 000 | 4 100 |

Source: Estimated from collated data published by the US Defense Department.

Notes

a In 1983, the Army's acquisition objective for the 155-mm GB2 projectile, as authorized by the Congress, had been 410 000 rounds [210]. That, however, would have been the objective for equipment of US forces only. In March 1984, the Congress was told by the Army that 'the current stockpile of GB artillery munitions represents approximately 20 per cent of our identified requirement'; acquisition of the 155-mm GB2 round would close this 'critical operational gap' [182].

b The numbers given here show what appeared during 1985 to be the Administration's current acquisition objective.

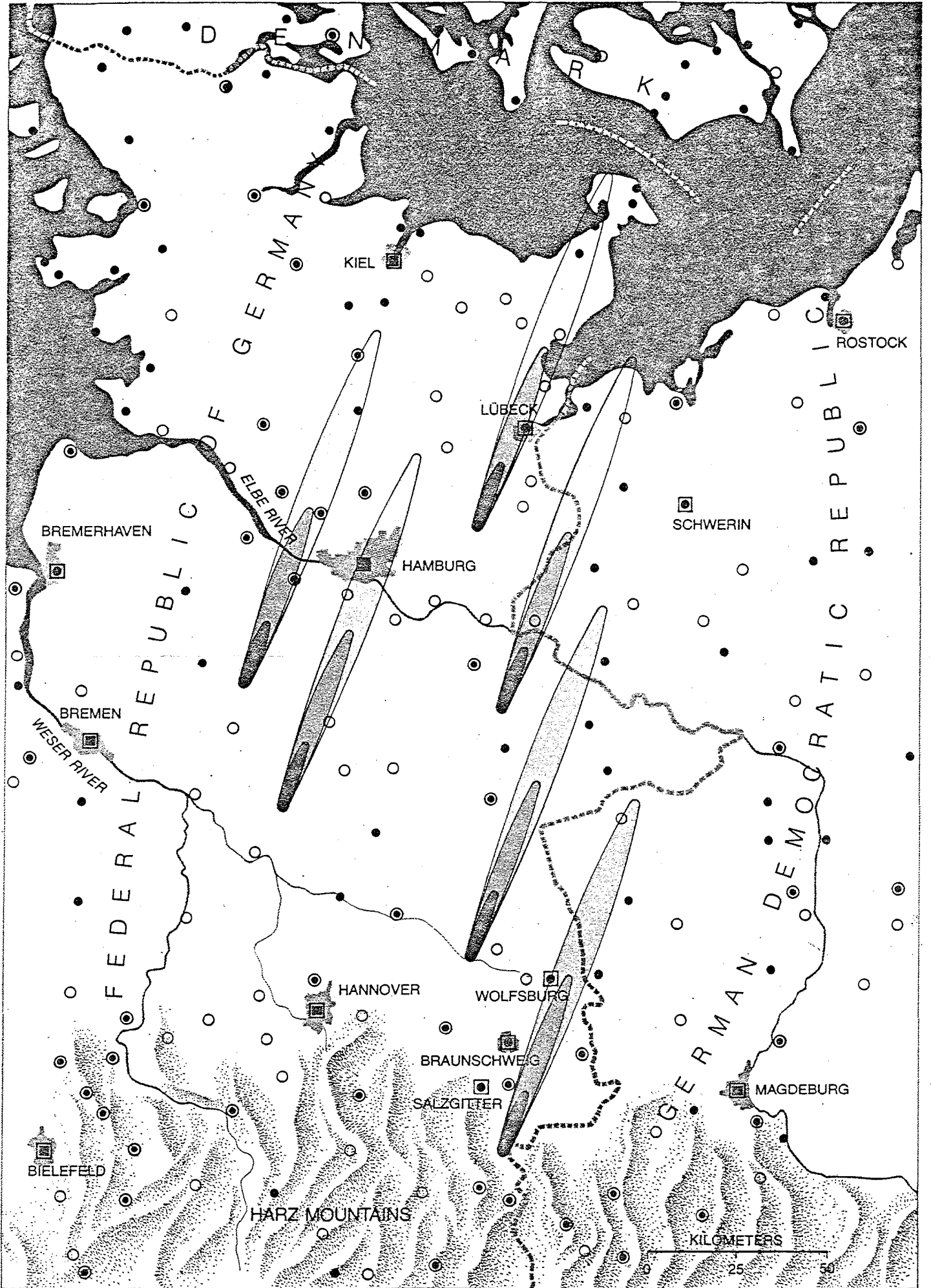
shortcoming in allied conventional defenses' [365] and therefore in need of modernization, as via the binary programme on which the Congress would very soon be voting. But European defence ministers were opposed to joining in any statement which suggested that CW weapons were 'conventional', and no such declaration emerged; nor--it seems [386]--was any comparable sentiment expressed in the agreed Ministerial Guidance. However, the 'series of questions' from the military authorities may now be assumed to have established itself within the bureaucratic channels of NATO, requiring action from the political authorities which the new US legislation on the binary programme will further stimulate. Progress on this particular front will presumably be one of the matters addressed in the report which the US Congress has required of the President by October 1986.

In fact, politicians in the leading European NATO countries had not been inactive on the CW issue, though the directions taken seem not to have been the ones hoped for by SACEUR. In West Germany and Britain, as in other European NATO countries, it is likely that any move towards CW rearmament will provoke a repetition of the neutron-bomb and INF discords of the recent past. The 1985 West German defence white paper referred to Soviet CW weapons in several places but, unlike its predecessor in 1983, was silent on the question of NATO CW armament [55]. Although this question was addressed in a position paper on CW weapons which the Federal Defence Ministry made available to the press in March [56], the paper endorsed a NATO capability in the narrow sense of reprisal, not of retaliation in kind. A press report stated that West German sources had let it be known in the US Congress that the Kohl Administration would accept binary munitions into West German storage, but not openly [450]. Even if that report were true, such an assurance would hardly have remained possible after the events of June, when the simultaneous binary-authorizing vote in the US House of Representatives and the unveiling of the SPD/SED European CW weapon-free zone proposal referred to below (pages 49-50) caused all the West German parliamentary political parties to adopt positions firmly opposed to any basing of binaries on Federal soil [e.g. 61, 362]. In fact, by letter dated 10 October 1984, SACEUR had assured the chairman of the Bundestag Defence Committee that he had not 'asked for the stationing of additional US chemical weapons in the FRG' [409], although the ranking SPD member of the Committee was later to express strong doubts about this assurance [398]. That there should be no such basing appears to have been one of two preconditions for the statements of support for the

binary programme made by the Christian Democrats, Chancellor Kohl's party; the other apparent precondition was that, once binary munitions had been acquired by the USA, the present US stocks of chemical weapons in the Federal Republic would be withdrawn [61, 63]. US Defense Secretary Weinberger had apparently offered an assurance of such withdrawal [62, 399], only to retract it later [399]. In the Bundestag on 3 October 1985, the CDU/CSU spokesman reiterated opposition to forward deployment of binary munitions and advocated removal of the existing stocks of chemical weapons from West German soil if the United States started production of binary munitions.

More information about those US stocks emerged during the year. CINCEUR said they constituted a '2-3 day supply' [199]. They were reported, on good authority, to comprise some 435 tons of CW agent (GB and VX nerve gases only, according to an earlier report [308a]), all of it held in artillery projectiles [312b]--probably about 6500 tons of 155-mm and 8-in rounds. In refutation of allegations made in a television documentary [369], the Federal Defence Ministry stated that the stocks consisted only of sound and serviceable munitions, that there were no M55 rockets among them, and that there had never been any accidents or leakages [57]. Elsewhere the Ministry stated that there had been US stocks of CW weapons on West German soil since before the founding of the Federal Republic, and that nowadays they were subject to stringent Federal inspections [56]. The television documentary, identifying the storage location as Fischbach, near Pirmasens, stated that at least some of the stockpiled munitions had been moved in from across the French border at Au-Roselier, near Verdun, in 1967 [369]. Contrary to expectations, the Federal Constitutional Court handed down no decision on the constitutional complaint regarding the stocks which the Rheinland-Pfalz section of the German Trades Union Federation had lodged with it in August 1982 [67, 410], the first of three such citizens' suits.

In Britain, it transpired--from ministerial reactions to a leak of secret Cabinet-level information early in 1985 [448]--that the political leadership had been giving close attention to CW policy options during the previous spring and summer. On 2 August 1984, a special Cabinet committee chaired by the Prime Minister had decided that, as regards CW weapons, there would be no change from the policy of non-armament that had been in place since the late 1950s [480]. This was a decision against Britain either producing CW weapons of its own or providing basing facilities for



LETHAL AREA FOR VARIOUS NERVE GAS EXPENDITURES

| EXPENDITURE | ROUNDS | TONS | LETHAL AREA (KM ²) |
|--------------------------|---------|--------|--------------------------------|
| US ARTILLERY 30 DAYS | 150,000 | 600 | 1,200-6,000 |
| NATO ARTILLERY 30 DAYS | 450,000 | 1,800 | 3,600-18,000 |
| "JCS REQUIREMENT" EUROPE | | 19,000 | 40,000-200,000 |