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REPORT OF THE MISSION DISPATCHED BY THE SECRETARY-GENERAL TO
INVESTIGATE ALLEGATIONS OF THE USE OF CHEMICAL WEAPONS IN THE
CONFLICT BETWEEN THE ISLAMIC REPUBLIC OF IRAN AND IRAQ

Note by the Secretary-General

1. The Secretary-General regrets to inform the Security Council that chemical weapons continue to be used in the conflict between the Islamic Republic of Iran and Iraq in violation of the Geneva Protocol of 1925. This is the unanimous conclusion of the mission of specialists which recently completed its field investigations in both countries.
2. These investigations were in continuation of those originally undertaken in March 1984 and conducted further in April 1985 and February 1986, the circumstances of which were summarized in the Secretary-General's note on the last report. 1/
3. The four specialists who had conducted the preceding field investigations in March 1984 and February 1986 were requested by the Secretary-General to undertake the present investigation. They are:

Dr. Gustav Andersson, Ph.D.
Senior Research Officer
Deputy Head, Chemical Division
National Defence Research Institute
Umea, Sweden

Dr. Manuel Dominquez
Colonel, Army Medical Corps and specialist in nuclear,
biological and chemical weapons injuries
Professor of Preventive Medicine
Universidad Complutense de Madrid
Madrid, Spain

Dr. Peter Dunn, A.M., D.Sc., B.Sc. (Hons), FRACI
Superintendent, Organic Chemistry Division
Material Research Laboratories
Defence Science and Technology Organization
Department of Defence
Melbourne, Australia

Oberst. Ulrich Imobersteg, Dr. Phil. Chem.
Former Chief, Nuclear, Biological and Chemical
Weapons Defence
Gunten, Switzerland

Mr. Iqbal Riza, Director, Office of the Under-Secretaries-General for Special Political Affairs, again was assigned the responsibility of co-ordinating the tasks of the specialists and of dealing with the relevant authorities in the Governments of the Islamic Republic of Iran and Iraq.

4. The specialists submitted a joint report to the Secretary-General on 6 May 1987. The Secretary-General wishes to place on record his deepest appreciation to the members of the mission for the exemplary dedication and efficiency with which they completed their assigned responsibilities, despite the pressures of time and limited resources. He wishes in particular to commend their sense of duty in conducting their investigation in the combat zone in hazardous conditions, notwithstanding the safety assurances provided by the Governments of the Islamic Republic of Iran and Iraq for which he records his gratitude. He also wishes to express his appreciation to the Governments of Australia, Spain, Sweden and Switzerland for the services of the specialists and for the facilities of their laboratories.

* * *

5. In transmitting the report of the mission of specialists (see annex) to the Security Council, the Secretary-General cannot but express his deep dismay at the mission's conclusions about the continued use of chemical weapons in the conflict between Iran and Iraq. The specialists' findings that chemical weapons were again used against Iranian forces by Iraqi forces, also causing injuries to civilians in the Islamic Republic of Iran and that now also Iraqi forces have sustained injuries from chemical warfare must add new urgency to the grave concern of the international community. The fact that the use of chemical weapons continues despite repeated appeals by the Security Council and the Secretary-General gives rise to the fear that such use could escalate and seriously undermine the Geneva Protocol of 1925, which has heretofore been considered one of the most worthy and successful attempts by the international community to mitigate the effects of war.

6. The Secretary-General wishes to draw the attention of the Council to the comment of the specialists that, having now undertaken several missions "... technically there is little more that we can do that is likely to assist the United Nations in its efforts to prevent the use of chemical weapons in the present conflict ...". It is indeed evident that only concerted efforts at the political level can now hold out any hope of maintaining commitment to this vital Protocol, most importantly in the present conflict. The Secretary-General has repeatedly made clear that he considers the violation of the Geneva Protocol to be one of the gravest infringements of international norms and that he strongly and unequivocally condemns the use of chemical weapons whenever and wherever this may occur. He urges the parties concerned and all Governments to direct their full attention to the implications of the present report.

7. The Secretary-General, at the same time, reaffirms that his paramount objective is to bring this protracted and ruinous conflict to the earliest possible end through a comprehensive, just and honourable settlement. He remains convinced that ultimately this is the only way to end the appalling loss of life, to prevent the spread of the conflict and to ensure regional and international peace and security. The Secretary-General recalls that he has presented specific ideas to the parties and to the Security Council and reaffirms his readiness to assist in the search for such a settlement. He appeals to both Governments urgently to respond to the efforts of the United Nations to restore peace to the peoples of the Islamic Republic of Iran and Iraq.

Notes

1/ S/17911.

Annex

REPORT OF THE SPECIALISTS DISPATCHED BY THE SECRETARY-GENERAL
TO INVESTIGATE ALLEGATIONS OF THE USE OF CHEMICAL WEAPONS
IN THE CONFLICT BETWEEN IRAN AND IRAQ

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LETTER OF TRANSMITTAL

Geneva
6 May 1987

Sir,

We have the honour to submit herewith our report on the investigations you requested us to undertake concerning continued allegations of the use of chemical weapons in the Iran-Iraq conflict.

In order to undertake the investigation we visited the Islamic Republic of Iran for the third time from 22 to 29 April 1987 for the purpose of carrying out on-site collection and examination of evidence. We also visited Iraq from 29 April to 3 May 1987 for the first time in order to carry out an investigation in that country. Although we were appointed in our individual capacities, we all agreed to work as a team and our conclusions were reached unanimously.

In preparing our report we have taken into account the reports of investigations undertaken by us in 1984, 1985 and 1986 at your request. As the conclusions of the present report are not in conflict with those of earlier missions, a summary statement has been included at the end of the present report.

Although the number of chemical casualties we saw in the Islamic Republic of Iran and the severity of their injuries was considerably less than seen by us in 1986, we were very disturbed to find that there now have been numerous civilian casualties as a result of attacks by mustard gas. In a hospital in Tehran we saw the effects of mustard gas on a peasant family, particularly a mother and her two small daughters aged two and four years. We had the distressing experience of witnessing the suffering of the four-year-old child less than two hours before her death. In addition, we saw the very damaging effects of mustard gas on the young mother, who was four months pregnant.

As a result of the present mission to both the Islamic Republic of Iran and Iraq, we view with great concern the continuing resort to chemical warfare in spite of the fact that both countries are signatories to the Geneva Protocol of 1925. While we are fully aware that all weapons are lethal and destructive, we wish to emphasize that chemical weapons are inhumane, indiscriminate in their action and cause long-term disabilities and suffering. It is vital to realize that the continued use of chemical weapons in the present conflict increases the risk of their use in future conflicts. In view of this, and as individuals who witnessed first hand the terrible effects of chemical weapons, we again make a special plea to you to try to do everything in your power to stop the use of such weapons in the Iran-Iraq conflict and thus ensure that they are not used in future conflicts.

The undersigned team members have now conducted three missions to the Islamic Republic of Iran and one to Iraq. We all firmly believe that, at the specialist level, we have done all that we can to identify the types of chemicals and chemical weapons being used in the Iran-Iraq conflict. If, in the future, a further mission is requested, then we will of course all be ready to respond. However, we now feel

/...

that technically there is little more that we can do that is likely to assist the United Nations in its efforts to prevent the use of chemical weapons in the present conflict. In our view, only concerted efforts at the political level can be effective in ensuring that all the signatories of the Geneva Protocol of 1925 abide by their obligations. Otherwise, if the Protocol is irreparably weakened after 60 years of general international respect, this may lead, in the future, to the world facing the spectre of the threat of biological weapons.

In undertaking the present mission we received support from many organizations and individuals. In particular we would like to record our thanks to the Governments of the Islamic Republic of Iran and Iraq for the co-operation and assistance provided throughout our mission.

Our special thanks are due to the United Nations-designated laboratories in Switzerland and Sweden, which assisted us in the technical aspects of this mission. We also wish to express our very sincere appreciation for the assistance we received from the Secretariat of the United Nations, particularly from Mr. Iqbal Riza of the Office of the Under-Secretaries-General for Special Political Affairs, who accompanied us on this and previous missions. His assistance and contacts with senior government officials in both the Islamic Republic of Iran and Iraq were invaluable.

Finally, we wish, Mr. Secretary-General, to express our gratitude to you for the continued confidence you have again reposed in us.

Yours sincerely,

(Signed) Dr. Gustav Andersson

(Signed) Dr. Manuel Dominguez

(Signed) Dr. Peter Dunn

(Signed) Col. Ulrich Imobersteg

I. TERMS OF REFERENCE

1. The mission was requested by the Secretary-General to determine, to the extent possible, whether there had been renewed use of chemical weapons in the conflict between Iran and Iraq and, if so, the extent and circumstances of their use. It was also indicated that the mission's investigations were in continuation of those first conducted by it in March 1984 and February 1986. In accordance with the itinerary arranged by the United Nations, our investigations were conducted both in Iran and in Iraq.

II. REVIEW OF DOCUMENTATION

2. In preparation for the drafting of the present report, we reviewed the following United Nations documents:

(a) Report dated 26 March 1984 of the specialists appointed by the Secretary-General to investigate allegations by the Islamic Republic of Iran concerning the use of chemical weapons; a/

(b) Letter dated 17 April 1985 from the Secretary-General addressed to the President of the Security Council (concerning the medical examinations conducted in April 1985); b/

(c) Report dated 12 March 1986 of the mission dispatched by the Secretary-General to investigate allegations of the use of chemical weapons in the conflict between the Islamic Republic of Iran and Iraq; c/

(d) Letters concerning chemical weapons from the Government of Iran to the Secretary-General since the issue of the report dated 12 March 1986; d/

(e) Letters concerning chemical weapons from the Government of Iraq to the Secretary-General since the issue of the report dated 12 March 1986; e/

(f) Statements by the President of the Security Council and by the Secretary-General relating to the use of chemical weapons. f/

3. During the drafting of our report, we referred to the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare signed at Geneva on 17 June 1925. g/

III. METHODOLOGY

4. In order to carry out our task, we adopted, as required, the following approaches:

(a) Interviews with government officials in Tehran and Baghdad in order to obtain information regarding the alleged use of chemical weapons;

(b) Visits to war zones in Iran and Iraq in order to examine evidence of weapons used in alleged chemical attacks and to collect samples for chemical examination in specialized laboratories located in Europe;

(c) Clinical examinations of, and interviews conducted with, a number of patients who were allegedly exposed to an attack of chemical warfare agents. The clinical examinations were conducted both in the war zone and in hospitals in Tehran, Iran, and Baghdad, Iraq, to which patients had been evacuated.

5. We must point out that the relatively long intervals between the alleged attacks and our actual arrival in the areas to collect samples for chemical analysis resulted in the degradation and evaporation of chemical agents. This made our task of detecting such agents much more difficult, as it is essential that samples be obtained as quickly as possible after their use.

6. The type of sampling, detection and protective equipment used by the mission in 1986 (and described in our last report) was again used by members during the present mission. This equipment included the Chemical Agent Monitor (CAM, Graseby Ionics Ltd.) that we used for the first time in 1986. Team members confirm that the type of equipment used is ideal for the operations to be performed, since it is self-contained, readily transportable and provides adequate protection for participants.

7. The team spent six days in Iran and three days in Iraq (for the chronology of activities, see appendix I). In Tehran, we paid visits to the Ministry of Foreign Affairs and to several hospitals. A visit was made to the war zone in south-west Iran by travelling to the Iranian Air Force Base at Omidyeh by aircraft and then to Khorramshahr by road. Weapon components found in the area and identified by us were transported back to Tehran for critical examination. One visit to the war zone around Baneh and Alout on the north-west border had to be abandoned because of bad weather. A second attempt to visit the area several days later also had to be abandoned, when the mission was approaching Baneh in a military helicopter, because of safety considerations associated with Iranian military operations started the previous day in the area.

8. In Iraq, the team examined chemically injured patients in a military hospital in Baghdad. Some members then visited an army depot to examine weapon fragments that had been returned from the war zone around Basra. The team was prevented from travelling to the war zone by military helicopter because of a severe, unexpected dust storm in the Baghdad area. Because of time constraints relating to safe-conduct arrangements, the team then travelled to Shoiba Air Base, Basra, by small jet aircraft and then to the war zone, East of Basra Sector, Third Corps Operations Zone, by road. The return journey from Basra to Baghdad was also made by jet aircraft.

9. At all times during our visits to the war zones in both Iran and Iraq we were heavily guarded and special attention was paid to the provision of timely and adequate protection. The visits to the war zones around Khorramshahr and Basra were made in very hot conditions with temperatures in the range of 35° to 38°C, which accelerate the evaporation and degradation of chemical agents.

10. In Iran, it was unfortunate that on one occasion weather conditions and on another, safety considerations, prevented us from reaching a site for inspection in the north-west border region. These delays and repeated organizational problems in relation to our itinerary and movements resulted in the ineffective utilization of time available. Team members were also placed under considerable stress by the frequent changes of plans. In Iraq, the programme for the visit was straightforward and arranged in a very effective manner.

11. It is interesting to note that while the mission was in Iran it received considerable local publicity. Regular press reports appeared and on all occasions the team was accompanied by media representatives and photographers, which, despite our repeated protests, on occasions made our work difficult. By contrast, in Iraq there was no report of our mission in the local press and no media representatives or photographers were present during our inspections. Mission members preferred this latter approach.

IV. INVESTIGATIONS IN IRAN

A. Medical aspects

12. The medical aspects are based on very careful examinations carried out, on 23 April 1987, on five civilian patients hospitalized in the Baqhiyat-Allah Hospital in Tehran, 25 admitted to the Loghmaan Hospital in Tehran, and 16 admitted to the Labaffi-Nejad Hospital on 26 April 1987. The patients examined were selected by the medical specialist on the mission from among those whom the hospital physicians said had been exposed to chemical agents. The study was conducted by questioning, through an interpreter, and examining the patients and by reading some clinical histories. The opinions of various hospital physicians were also heard.

13. The study showed that these patients could be classified into three clinically different groups.

14. The first group was composed of five civilian workers at a water installation located north of the city of Khorramshahr who were exposed on 10/11 April 1987 to an attack by eight rockets launched from a helicopter, resulting in about 100 victims (including 20 workers from this installation); 15 of the victims died, including five workers. The rockets exploded at a distance of between 100 and 150 metres from the workers, who protected their faces with wet handkerchiefs. They saw white or grayish-white clouds issuing from the rockets with an odour which some described as pungent, others as onion or garlic-like, or as very unpleasant.

15. The case histories showed that the patients had bradycardia, arrhythmia, acute miosis which did not change with darkness or use of atropine, generalized trembling and sometimes convulsions. Some patients developed rhinorrhea, excessive salivation, sweating and respiratory insufficiency, sometimes resulting in respiratory failure. The viewing of a video recording taken a few hours after the exposure confirmed some of these data. It could be seen that the torpor and drowsiness of these patients were more marked than those found in the patients seen

in 1984 and 1986. At the time of the examination they had completely recovered, with only one exhibiting moderate conjunctivitis with discrete photophobia. Effective treatment was achieved with atropine in initial doses of 6 mg, increasing to 40-60 mg and in some cases 700 mg by the end of the treatment, together with Pralidoxime, oxygen therapy and diazepam in cases of convulsions.

16. As a result it was concluded that these patients had suffered from exposure to an acetylcholine esterase-inhibiting substance which, in view of the histories observed in the patients in 1984 and 1986, could be assumed to be the result of tabun intoxication.

17. An Iranian physician who had immediately attended to the victims insisted that, in the attack in question, he had treated persons exposed to hydrocyanide, usually considered to be a haematic weapon although incorrectly so, since it affects the tissues. He based his opinion on the absence of miosis and successful treatment with the inhalation of amyl nitrite and the injection of thiosulphate. From our observation we cannot affirm that this gas was used; indeed, its use could have been medically proven only at the time of the attack itself.

18. The second group of patients is composed of 12 combatants who were exposed on 10/11 April to a rocket attack at Khorramshahr; four civilians (two women and two girls aged two and four) exposed on 16 April 1987 in the town of Alout in the Baneh area to an attack by missiles of unknown origin and means of launching; and three persons exposed on 20 April 1987 in Sardasht to an attack by bombs dropped from aircraft, all of whom had been admitted to Loghman Hospital; and 14 patients admitted to the Labaffi-Nejad Hospital, three of whom were from Khorramshahr and had been exposed on 10/11 April, nine from Sardasht and one from Baneh exposed on 21 April. The patients had been exposed to chemical agents spread by various means which gave off, as they fell, a cloud with an odour of garlic, according to many of the victims.

19. The examination of the patients took place from two to 12 days after their exposure, and the lesions were therefore in various stages of development.

20. Initially a very acute conjunctivitis developed which caused severe ocular pain, with extreme photophobia and lachrimation. The conjunctivitis was very persistent and was visible in most of the patients at the time of examination. In some cases rhinorrhoea was present.

21. Itching appeared early on, which began to be painful in extensive cutaneous areas. In many cases there was nausea and vomiting.

22. Erythema developed immediately, covering cutaneous areas of various sizes. The erythema quickly darkened and became most acute in the armpits, groin and genitals. The skin became completely black, especially in the above-mentioned areas. Blisters also formed, ranging from a few millimetres to several decimetres in diameter, in rounded shapes which adapted to the area in which they were located. The palms of the hands and soles of the feet, and almost always the scalp, remained unaffected.

23. The blisters were filled with a clear, amber liquid which maintained pressure on the dome of the blister. When the wall of the blister broke, a lesion was left resembling one that would result from second-degree burns, with dark or blackened edges.

24. Acute leukopenia was observed in only one case.

25. Some patients developed pharyngo-laryngitis, cough, expectoration which was in some cases hemoptysic, and acute respiratory insufficiency with functional examinations showing lower readings. A 4-year-old girl (case B-12) suffered only a pulmonary pattern of bronchiolitis and oedema, with no cutaneous lesions of any type and no conjunctivitis. About 90 minutes after being examined, the girl died of respiratory insufficiency, despite the tracheotomy which had been performed to assist her in breathing. When the bomb fell, the child had been in her house and her mother (case B-11) had gone in to save her; it is possible that the inhalation of the chemical agent, which had been absorbed by the mother's clothes, was the source of the girl's exposure.

26. In general, the lesions were somewhat less acute and serious than those seen in 1984, 1985 and 1986.

27. As a result of the examination of the patients, it was unquestionably concluded that these patients had been exposed to mustard gas (yperite).

28. The third group of patients consists of those exposed to chemical weapons between February 1986 and March 1987. Three persons (cases B-4, B-24 and B-25) were exposed at Shalamchah on 21 January 1987 and one (case B-20) at Abadan on 26 March 1987, and were treated at the Loghmaan Hospital; one patient was exposed in January 1987 at Khorramshahr (case C-5) and another (case C-6) in February 1986 at Al-Faw.

29. None of these patients exhibited active skin lesions. Among them, only the one exposed in March had conjunctivitis. The patients suffered from a persistent, irritative and productive cough, cyanosis and concave fingernails; some had drumstick fingers. Thoracic percussion indicated a tightness in the chest, and auscultation revealed crepitant and sibilant rale in both hemithoraxes. Respiratory functional tests showed an insufficiency. The pattern corresponded to a chronic bronchitis developing into pulmonary fibrosis.

30. The retrospective examination of these patients demonstrated that they had been exposed on the dates cited to mustard gas and that at the time of the examination they had developed progressive pulmonary fibrosis as a result of the exposure to this chemical agent.

B. Chemical aspects

31. It is again important to record that there was a delay of about two weeks between the dates of the alleged attacks to be investigated and the arrival of the mission at the site of the attacks. A detailed inspection of sites in the

Khorramshahr area was made on Friday, 24 April 1987. Attempts to visit attack sites in the Baneh area on Saturday, 25 April 1987, and Monday, 27 April 1987, were not successful (see appendices I and II).

32. In the Khorramshahr area, five specific attack sites were inspected. The first site was a housing complex, which was reached at about 1200 hours. The alleged attack had taken place on the night of 11 April 1987 at 2330 hours and had lasted about three hours. It was stated that bombs, artillery shells, rockets and mortars had been used. We examined several craters near to and within a building and noted the smell of mustard gas degradation and by-products. A positive indication of the presence of mustard gas was also obtained by the use of CAM. In addition, we recovered the suspension lug and filler plug assembly of a mustard gas bomb similar to those examined by the team in 1984 and 1986.

33. At the second site, about 50 m from the first site, we found a rocket motor case (90 mm diameter) in a crater. About 3 km from this site in an area known as the waterworks (site 3) we examined another rocket (122 mm diameter) in a crater adjacent to a building. Although it was claimed to be a chemical rocket we were unable to detect the presence of toxic agents in the area. A number of animals (cat, frog, pigeon) that were stated to have died as a result of the chemical attack were shown to us. Several hundred metres away at site 4 we examined another rocket (122 mm diameter) embedded in the gutter of a road. The final site visited was about 4 km from site 4 and was the site of a field hospital built near some fortifications. Craters resulting from rocket attacks were examined and a rocket (122 mm diameter) was recovered for return to Tehran for further investigation, along with the rocket cases and remnants recovered from sites 2, 3 and 4.

34. Although we detected traces of mustard gas at one site, the concentration level was so low because of the length of time since the attack and the decontamination of the area that it was not reasonable to take a sample for laboratory analysis.

35. On Tuesday, 28 April 1987, we visited the Abali Military Base at Tehran to examine weapon fragments returned from the Khorramshahr area. Using CAM, a vapour concentration of 1.0-4.0 mg/m³ was measured adjacent to a twisted piece of the case of a chemical bomb recovered from the alleged attack that occurred on 11 April 1987. The vapours were collected by drawing air through two separate XAD-2 sample tubes (SKC Inc.) with an air pump. A total volume of about 3 litres was sampled through each tube. The tubes were delivered to the National Defence Research Institute (FOA4), Umea, Sweden, for chemical analysis. In addition, a dark-coloured solid substance was scraped from the bomb case and placed in four screw-capped glass bottles. Each bottle was then placed in a separate screw-capped plastic jar containing activated charcoal as an adsorbent. Samples No. 1 and 2 were delivered to the AC Laboratory, Spiez, Switzerland, for chemical analysis. Samples No. 3 and 4 were also delivered to the Swedish National Defence Research Institute for chemical analysis.

36. The air samples were shown to contain between 3 and 7 mg/m³ of mustard gas bis-(2-chloroethyl)-sulphide. The major component of the solid samples was also identified as mustard gas. In addition, some minor by-products were also

identified. The results from the AC Laboratory in Switzerland and those from the Swedish National Defence Research Institute, which are similar, are given in appendices IV and V. Spectra, chromatograms and other experimental details can be obtained from the laboratories on request.

C. Munitions aspects

37. During the inspection of attack sites in the Khorramshahr area as detailed in paragraphs 31 to 33, two types of rockets were shown to us by the Pasdaran and then were subsequently returned to Tehran for further examination. It is now believed that the recovered, damaged, 90 mm rocket is an air-to-surface missile and that the two recovered, exploded, 122 mm rockets are surface-to-surface rockets fired from a BM21 multiple rocket launcher. We did not locate fuses for either type of rocket. It should be noted that the design of the 122 mm rocket is such as to make it ideal as a vehicle for carrying chemical agents.

38. Except for the bomb suspension lug and filler plug assembly mentioned earlier, no other bomb components were recovered. The bomb fragments that we sampled at the Abali Military Base, Tehran on Tuesday, 28 April 1987, were collected by Iranian authorities.

39. Also at the Abali Military Base we were shown two unexploded (and unfired) 155 mm artillery shells, which the authorities claimed were chemical shells. Markings on the bomb indicated this claim to be a possibility. Under our supervision, one of the shells was disassembled and shown to contain a high explosive filling and not a chemical agent, as thought.

V. INVESTIGATIONS IN IRAQ

A. Medical aspects in Iraq

40. The medical aspects are based on examinations carried out on 30 April 1987 on 15 patients of a total of 52 admitted to the Al-Rasheed Military Hospital in Baghdad for exposure to chemical weapons, study of the autopsies performed on five cadavers, observation of three cadavers of a total of 17, examination of eight patients treated at the Basra Military Hospital and, lastly, examination of nine soldiers back on duty at the front.

41. The study was conducted by examining the case histories of the exposure and the initial symptoms, by examining the patients and, in those whose symptoms were mainly respiratory, by studying a series of chest X-rays.

42. In Iraq there were two groups of cases which were clearly distinct from a clinical standpoint.

43. The first group was composed of five patients hospitalized in the Al-Rasheed Military Hospital in Baghdad, having been exposed between 10 and 13 April 1987 (cases D-1 to D-5), one cadaver in cold storage in the morgue, and nine soldiers examined at the front who exhibited primarily skin lesions.

44. The pattern was one of conjunctivitis which ranged from very discrete to one very serious case with photophobia, lachrymation and palpebral oedema. There was a blackening of various areas of the skin, desquamation and lesions resembling those produced by second-degree burns. The extent and shape of the lesions was variable. The general state of health ranged from good to, in two cases, seriously affected. The genitals were black, oedematose and painful in the majority of cases. In two cases there was acute bronchial affection with expectoration.

45. These results clearly indicated that these patients had been exposed to mustard gas.

46. The second group of patients was made up of 10 persons exposed between 9 and 11 April 1987 (cases D-6 to D-15) who were seen at the Al-Rasheed Military Hospital in Baghdad, two cadavers in the morgue of that hospital, another five out of a total of 16 cadavers autopsied, and eight patients treated at the Basra Military Hospital (cases E-1 to E-8).

47. The symptoms appeared from a few seconds to some five minutes after the exposure. In all cases an affection of the eye occurred, with lachrymation, photophobia and in some cases a burning feeling. In one case, increased nasal secretion developed. Vomiting was very frequent, containing blood in a fair number of cases; in one patient there was abdominal distension.

48. There appeared obstructive respiratory difficulty, with an irritative, persistent cough and the expectoration of a mucosal, foamy and yellowish sputum containing blood in most cases. Those affected suffered from tightness of the chest.

49. In most cases there was loss of consciousness for about 30 minutes, although some only collapsed without losing consciousness; in others this lasted only a few minutes, but there was one case in which the patient remained unconscious for four days. Some patients had convulsions. Cyanosis was also exhibited in some cases.

50. Some patients felt dizzy, disoriented, weak or in pain, with a contraction of the leg muscles. One patient had the feeling that his body was swollen. Another had blood in the urine and a painful penis. None exhibited skin lesions.

51. The X-rays showed characteristics of acute bronchitis with pulmonary oedema.

52. Respiratory insufficiency was the cause of death in nine cases a few minutes after the attack, in three cases within 24 hours and in two within 48 hours of exposure. In one case death occurred 15 days after the intoxication. In the non-fatal cases, treatment based on corticoids, aminophylline, antibiotics and oxygen therapy was effective. Although the sputum in some cases became purulent, at no time did secondary bacterial pneumonia occur.

53. The results of autopsies on five cadavers showed no traumatic lesions, except in one case. In no case were there changes in the skin. All cases exhibited pulmonary oedema with increased lung weight. The lung showed petechial hemorrhages, both on the surface and in the cuts made. There were ruptured alveoli. The cutting released a foamy liquid. The bronchi were dilated and

haemorrhagic. The rest of the viscera were normal, except for a slight bluish tint. One cadaver had petechiae in the brain and erosion of the gastric mucosa.

54. On the basis of the foregoing, the conclusion was reached that these patients had undoubtedly been exposed to a highly aggressive irritant, probably phosgene.

B. Chemical aspects

55. A detailed inspection of sites in the East of Basra Sector, Third Corps Operations Zone, took place during the afternoon of Friday, 1 May 1987. Although an alleged attack with shells and mortar rounds filled with phosgene had taken place on the night of 10/11 April 1987, we were not able to visit the attack site close to the front to examine any weapon remnants because of dangers associated with the presence of snipers. Further, we should point out that phosgene, because of its volatility, can in practical terms be detected only within a few hours of its dissemination.

56. In the East of Basra Sector, about 8-10 km from the front line, five attack sites were inspected. The first site was a building made of concrete blocks, which allegedly had been hit and destroyed by a chemical shell during an attack at 2330 hours on 12 April 1987. The areas had been decontaminated and there was no odour of mustard gas degradation and by-products present. We were shown the base section and two large fragments of a 130-mm shell recovered from the rubble. At site 2, we were shown a mud-walled house with a hole in the roof where a 130-mm shell had penetrated and exploded. It was stated that the shell recovered from this site was the one we had examined in Baghdad the previous day. The damaged house had been decontaminated. The third site inspected was several kilometres away from sites 1 and 2 and we were shown a crater claimed to have been caused by the explosion of a chemical shell (see para. 60). There was a slight smell of mustard gas decomposition products in the area and we were shown detector tubes which had given a positive indication of the presence of mustard gas vapour in the crater. The fourth site inspected was similar to the third site.

57. At site 5, about 0.5 km from site 4, two shells had exploded in flat, hard ground about 30 m apart. The shell craters were similar to those seen at sites 3 and 4. No weapon fragments were shown to us. The Iraqi authorities requested us to take soil samples from one of the craters. Under our observation, an Iraqi soldier using his own detection equipment obtained a positive response for the presence of mustard vapour in the crater. Some soil was removed from the bottom of the crater and a sample of contaminated soil was then collected. About 0.5 kg of sample was packed by us and transported back to Baghdad. In Baghdad, we repacked four small samples of soil (each about 20 grams) for safe transportation back to the laboratories already identified.

58. The soil samples were shown on analysis to contain between 0.5 and 3.0 ug/g of mustard gas together with some minor by-products. The samples also contained a large amount of thiodiglycol, which is a degradation product of mustard gas as well as a precursor in the production of mustard gas. The results from the AC Laboratory in Switzerland and those from the Swedish National Defence Research Institute, which are similar, are given in appendices IV and V.

C. Munitions aspects

59. Following the claim by Iraqi authorities that they had been attacked by phosgene and mustard gas in the Basra area on 10/11 and 12 April 1987 respectively, we had the opportunity on Thursday, 30 April 1987, at a military depot in Baghdad, to examine a recovered 130-mm artillery shell claimed to have been a mustard gas shell. According to the Commanding General of the Chemical Defence Section, mustard gas had been detected on the shell in the field and later by laboratory analysis in Baghdad, and after that the shell had been decontaminated. The wall thickness of the shell around the mid-section position was about 20 mm. Such shells are normally used for filling with high explosives. The shell had no internal chemical-resistant coating and we could not find any trace of mustard gas on it. Fragments of a similar 130-mm shell shown to us in the East of Basra Sector also had no chemical-resistant coating on the interior surfaces.

60. The crater in the third site (see para. 56), typical of several in the area, was about 60 cm in diameter and 1-1.5 m in depth. The escorting Iraqi officials pointed out that the angle of entry of the shell indicated clearly that it had been fired by opposing forces. It is relevant to note that craters of this depth and diameter are not normally associated with ordnance designed to disperse chemical agents over a surface area.

61. In addition to the Iraqi claims concerning the use against Iraqi forces of artillery shells filled with mustard gas and phosgene, Iraqi officials also said that mortar bombs filled with either phosgene or tear-gas had been used against them. No evidence was presented to substantiate this claim.

62. In discussions, senior officials stated that the chemical attacks on the night of 10/11 April 1987 were the first that Iraq had experienced during the course of the conflict between Iran and Iraq. It also was stated by some officials, and by a number of patients interviewed, that the casualties had been in the "first line" of deployment, 500 m to 1,000 m from the front, at the time of suffering injuries.

VI. SUMMARY OF FINDINGS

63. At the specific request of the Secretary-General, we visited the Islamic Republic of Iran from 22 to 29 April 1987 and Iraq from 29 April 1987 to 3 May 1987 in order to conduct an investigation into the alleged use of chemical weapons in the Iran-Iraq conflict. The experience, knowledge and results attained during three earlier investigations conducted in 1984, 1985 and 1986 were used to support the present investigation. Casualties were seen at hospitals in Iran and Iraq. Visits were paid to the war zone around Khorramshahr in Iran and Basra in Iraq. Attempts to visit the war zone around Baneh in north-west Iran were not successful owing to weather conditions and military operational requirements.

64. Summary comments in relation to the present investigation are as follows:

A. Investigations in Iran

(a) A thorough examination of the Iranian victims, both combatants and civilians, showed the presence in varying degrees of the following symptoms and signs: conjunctival irritation, chemical irritation of the respiratory tract, and cutaneous lesions ranging from the presence of a dark-coloured erythema to the presence of desquamative lesions and second-degree burns with black edges. In general, the lesions were less acute and the patients were in less serious condition than the cases observed in previous years (1984, 1985 and 1986). It may be unquestionably affirmed that these patients have been exposed to mustard gas. Also observed were evolving lesions of pulmonary fibrosis in patients formerly exposed to mustard gas. The retrospective examination of five patients led to the conclusion that they had probably been exposed to an acetylcholine esterase-inhibiting substance;

(b) Using a special instrument designed to detect chemical warfare agents (CAM), low concentrations of mustard gas vapour were detected at a site in Khorramshahr. In addition, a dark-coloured substance collected from a bomb fragment returned from the war zone to the Abali Military Base, Tehran and sampled by us, when analysed in approved laboratories in Europe, was found to contain mustard gas. An air sample taken near the same bomb fragment was also found to contain mustard gas. A summary statement is given in appendix VI;

(c) Examination of metal components of aerial bombs collected in the Khorramshahr area showed that the items had come from bombs that were similar to those examined by the team in 1984 and 1986. One recovered, exploded 90-mm air-to-surface missile and two recovered, exploded 122-mm rockets fired from a BM multiple rocket launcher were probably carrying chemical agents. A summary of chemical weapons used in Iran is given in appendix VII;

(d) We note that, in 1987, the number of casualties presented to us in Iran and the severity of their injuries was considerably less than seen by us in 1986. This could be due to improved protective measures used by the Iranian authorities or to a reduced scale of use of chemical weapons by Iraq.

B. Investigations in Iraq

(a) A detailed examination of the military patients and one cadaver revealed the existence of irritative conjunctival lesions, particularly skin lesions, characterized by blackening and the presence of blisters and ulcerations resembling those produced by varying degrees of burns, indicating that they had undoubtedly been produced by mustard gas. Another group of military patients and cadavers showed symptoms and signs of bronchitis and bronchiolitis with pulmonary oedema produced by an asphyxiating chemical agent (an irritant of the lower respiratory tract and alveoli), probably phosgene;

(b) Soil samples taken from a crater on the east of Basra sector resulting from the impact of a 130-mm artillery shell were found to contain traces of mustard gas and relatively large amounts of thioldiglycol which is a degradation product of

mustard gas as well as a precursor in the production of mustard gas. Summary details are given in appendix VI;

(c) A partly destroyed 130-mm artillery shell collected in the Basra area, and said to have been decontaminated, was examined at a military depot in Baghdad. We were unable to find any trace of mustard gas on it. The shell had a typical wall thickness for a high explosives item and no internal chemical-resistant coating as expected for a chemical shell. Fragments of a similar 130-mm shell shown to us in the Basra area also had no chemical-resistant coating on the interior surfaces. No other items of ordnance were presented to us. Summary details are given in appendix VII;

(d) Although the main evidence of the effects of mustard gas and a pulmonary irritant, possibly phosgene, on Iraqi troops is based on medical examination of casualties, we note that mustard gas was also detected in soil samples taken from a shell crater in the Basra area.

VII. CONCLUSIONS

65. From the present investigation, the following are our unanimous conclusions:

(a) In the areas around Khorramshahr, Iran, inspected by the mission, chemical weapons have been used against Iranian positions. In addition to military personnel, civilians have also been injured in these attacks. The main chemical used was mustard gas (ypelite), but nerve agents have probably been used on some occasions;

(b) In the area around Baneh, Iran, military personnel as well as civilians also have been injured by mustard gas, as evidenced by the medical examination of casualties and interviews with witnesses;

(c) From the examination of weapon fragments found in the Khorramshahr area, chemical bombs similar to those used in 1984 and 1986 have again been used against Iranian forces, indicating their continued deployment by Iraqi forces. In addition, it is most likely that chemical rockets have also been used against this area;

(d) In the areas around Basra, Iraq, inspected by the mission, Iraqi forces have been affected by mustard gas and a pulmonary irritant, possibly phosgene. In the absence of conclusive evidence of the weapons used, it could not be determined how the injuries were caused;

(e) The extent of the use of chemical warfare agents could not be determined due to constraints of time and resources and to the conditions under which the mission conducted its investigations.

66. Our overall unanimous conclusions after our investigations undertaken in Iran in 1984, 1986 and 1987, in hospitals in Europe in 1985 and in Iraq in 1987, are that:

(a) There has been repeated use of chemical weapons against Iranian forces by Iraqi forces, employing aerial bombs and very probably rockets. The chemical agents used are mustard gas (yperite) and probably, on some occasions, nerve agents;

(b) A new dimension is that civilians in Iran also have been injured by chemical weapons;

(c) Iraqi military personnel have sustained injuries from chemical warfare agents, which are mustard gas (yperite) and a pulmonary irritant, possibly phosgene.

Notes

a/ S/16433.

b/ S/17127.

c/ S/17911 and Corr.1.

d/ S/17925, S/17944, S/17949, S/18028, S/18036, S/18104, S/18322, S/18334, S/18549, S/18553, S/18555, S/18556, S/18557, S/18574, S/18577, S/18600, S/18605, S/18614, S/18626, S/18628, S/18635, S/18657, S/18675, S/18676, S/18679, S/18698, S/18723, S/18757, S/18788, S/18796, S/18799, S/18800, S/18809, S/18819, S/18820, S/18825, S/18828, S/18829, S/18837, S/18844.

e/ S/17922, S/17934, S/18806, S/18810.

f/ S/17932, S/18305, SG/SM/3953.

g/ League of Nations, Treaty Series, vol. XCIV (1929), No. 2138, p. 65.

Appendix I

CHRONOLOGY OF ACTIVITIES

Wednesday, 22 April 1987

Mission assembles in Frankfurt (1300)

Departure from Frankfurt (1500)

Arrival in Tehran (2215)

Thursday, 23 April 1987

Meetings at the Ministry of Foreign Affairs, Tehran (1100), with
Mr. M. J. Mahallati, Director-General for International Organizations

Visit to Biochemical and Biophysics Research Centre, University of Tehran
(1400)

Examination of and interviews with patients in the Baghiat Ullah Hospital,
Tehran (1500)

Examination of and interviews with patients in the Loghmaan Hospital, Tehran
(1745)

Friday, 24 April 1987

Departure for Khorramshahr (via Omidiyeh) for surveys in the war zone (0630)

Surveys of five sites in the area and examination of weapon debris and craters

Return (via Omidiyeh) to Tehran (2200)

Saturday, 25 April 1987

Departure for Baneh (via Bakhtaran) for surveys in the war zone (0630)

Mission could not proceed beyond Hamadan because of bad weather in the area

Return to Tehran (1700)

Sunday, 26 April 1987

Examination of and interviews with patients in the Labbafi-Nejad Hospital,
Tehran (1000)

Discussions with officials of the Ministry of Foreign Affairs (1300)

Monday, 27 April 1987

Departure from Tehran for Baneh via Sanandaj (0630)

Arrival at Sanandaj (0915)

Departure from Sanandaj by military helicopter for Baneh via Saqqez (1115)

Mission cancelled for safety reasons when about to land at Baneh (1215).
Return to Saqqez

Departure from Saqqez (1340) for Bakhtaran (1500)

Tuesday, 28 April 1987

Departure from Bakhtaran (0145) by Medivac aircraft for Tehran (0340)

Visit to Abali Military Base east of Tehran to examine weapon debris returned from the war zone in south-west Iran (1415)

Wednesday, 29 April 1987

Departure from Tehran for Istanbul (0800)

Departure from Istanbul for Baghdad (1845)

Arrival in Baghdad (2200)

Met by and held preliminary discussions with the Iraqi co-ordinator for the visit, Brigadier General N. Druby, Secretary of the Permanent Committee for War Victims, Ministry of Foreign Affairs

Thursday, 30 April 1987

Examination of and interviews with patients in the Al Rasheed Military Hospital, Baghdad (1015)

Examination of weapon fragments returned from the war zone around Basra at a military depot near central Baghdad (1400)

Friday, 1 May 1987

Arrival at Muthanna Airport, Baghdad (0745) for travel by military helicopter to Basra. (A dust storm delayed departure)

Departure by jet aircraft for Basra (1150). Arrival at Shoaiba Airfield (1250)

Departure for the war zone around the East of Basra Sector (1400) for the examination of five sites

Departure from the war zone for Basra Military Hospital (1645)

Departure from Shoaiba Airport (1840) for Baghdad (1740)

Saturday, 2 May 1987

Discussions with officials of Ministry of Foreign Affairs (1300)

Sunday, 3 May 1987

Departure from Baghdad (0800); arrival at Geneva (1515)

Monday, 4 May 1987

Preparation of report

Receipt of results of laboratory analysis at Spiez, Switzerland

Tuesday, 5 May 1987

Preparation of report

Receipt of results of laboratory analysis at Umea, Sweden

Wednesday, 6 May 1987

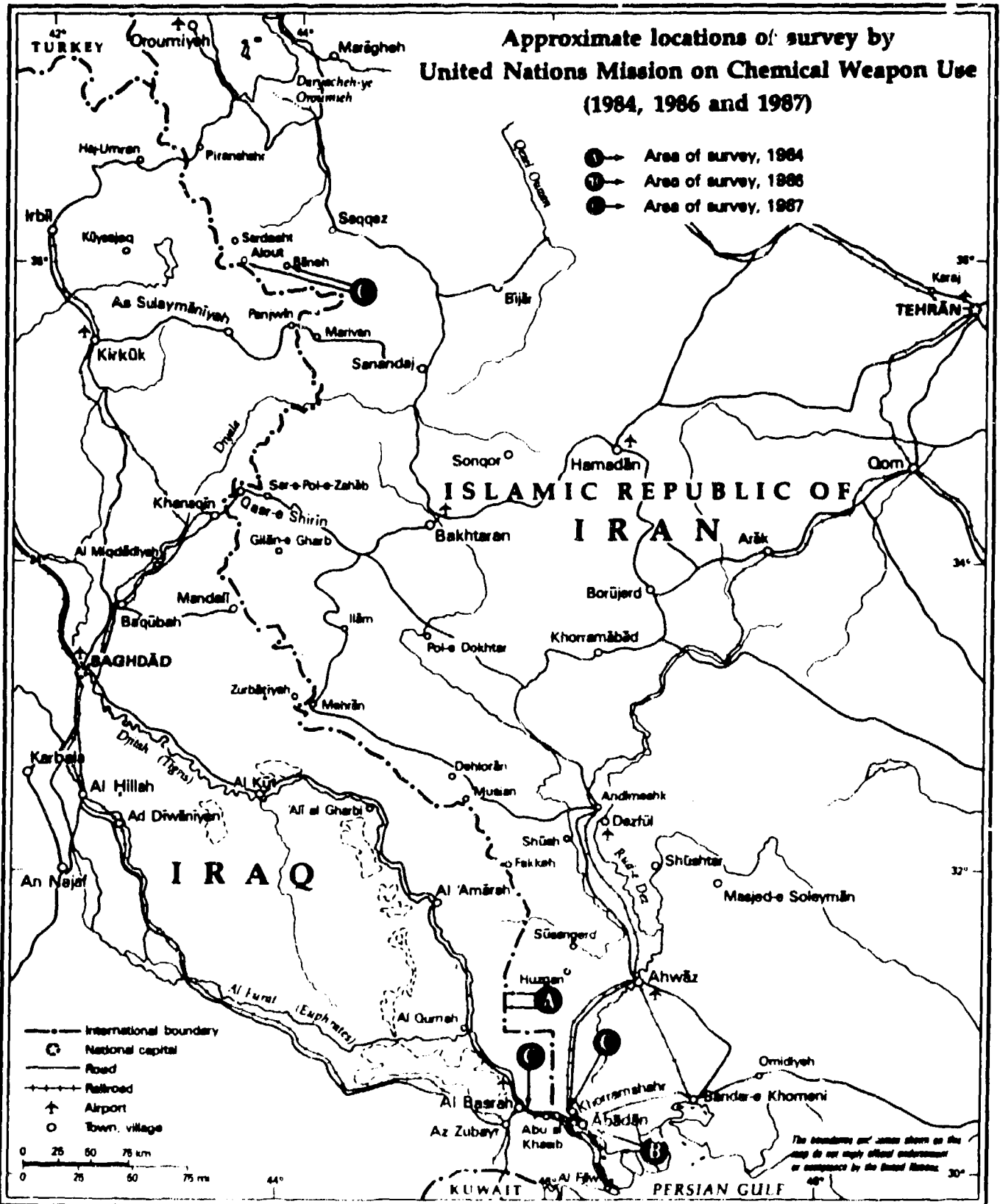
Finalization of report

Thursday, 7 May 1987

Mission disperses from Geneva

APPENDIX II

Map of Approximate Locations of Survey



Appendix III

SUMMARY REPORT ON PATIENTS EXAMINED BY THE MEDICAL
SPECIALIST WITH RELEVANT CLINICAL DATA

[To be issued as S/18852/Add.1]

Appendix IV

ANALYSIS OF SAMPLES OBTAINED FROM IRAN AND IRAQ
BY AC LABORATORIES, SPIEZ, SWITZERLAND

NC-Laboratory Spiez

Spiez, 3 May 1987

Analysis of samples from Iran and Iraq for CW agents

(brought to Switzerland on 2 May 1987)

1. Samples

(in glass flasks of 20 ml with screw cover)

From Khorramshahr:	Iran No. 1	Net weight ca.:	3 g	
	Iran No. 2		3 g	
From Basra:	Iraq No. 1		17 g)	soil
	Iraq No. 2		22 g)	samples

2. Rapid verification

2.1. Head space analysis (GC/MS, HP 5988A)

Sample Iran No. 1: 2 μ l of air gave a positive indication of S-mustard in the SIM-mode.*

Sample Iraq No. 1: 5 μ l of air gave no indication of S-mustard in the SIM-mode.*

2.2. Fast extraction

0.5 g of the sample was mixed with 0.5 g of anhydrous Na₂S₂O₄, filled into a Pasteur-pipette and extracted with 2 ml of dichloromethane.

Samples Iran No. 1 and No. 2:

Gas chromatograms (FID, HP 5890 and TIC,** GC/MS HP 5988A, see appendix 1) show a lot of peaks; identification of S-mustard by mass-spectrum and retention time as one of the main constituents.

[There was no need for a more intensive extraction!]

* SIM = selective ion monitoring.

** TIC = total ion current.

Sample Iraq No. 2: Only a slight indication of S-mustard in the SIM-mode (GC/MS, HP 5988A) after concentrating the extract to 0.1 ml.

3. Extraction of samples Iraq No. 1 and No. 2 by Soxhlet

About 10 g of the soil samples Iraq No. 1 and No. 2 were mixed with 5 g of anhydrous Na₂S₂O₄ and extracted for 1.5 hours with 70 ml of dichloromethane in a soxhlet apparatus. The extracts were concentrated to the volume of 1 ml.

4. Estimation of S-mustard concentration in the samples

According to analysis with external standard the following concentrations of S-mustard could be estimated:

Samples Iran (GC, FID): 2-3 mg/g

Samples Iraq (GC/MS, SIM-mode): 0.5-1.5 µg/g

5. Detailed qualitative analysis

5.1. Samples Iran (see appendix 1)

The two extracts showed similar chromatograms (FID). According to GC/MS-analysis (see copy of TIC-chromatogram) the following additional compounds could be identified:

- bis-(2-chloroethyl)-disulfide (peak 3)
- bis-(2-chloroethyl)-sulfoxide (peak 4)
- 1,2-bis-(2-chloroethylthio)-ethane = sesqui mustard (peak 5)
- 1,2'-bis-(2-chloroethylthio)-diethylether = oxygen mustard (peak 6)

Peak 2 could not yet be identified (two compounds!).

Various additional chlorinated compounds are present in minor quantities. Peaks with retention time > 13 min may correspond to hydrocarbons.

5.2 Samples Iraq (see appendix 2)

By GC/MS thiodiglycol could be determined in a concentration of about 0.3 mg/g (peak 1 in TIC-chromatogram).

S-mustard could be identified in the SIM-mode (see SIM-chromatogram). This confirmed the results of the fast extraction.

There are indications for the presence of traces of:

- 2-chloroethyl-2-hydroxyethylsulfide
- bis-(2-chloroethyl)-sulfoxide
- 1,2-bis-(2-chloroethylthio)-ethane = sesqui mustard

Peaks No. 2 and 3 (see TIC-chromatogram) could not yet be identified.
They do not seem to be related with mustard.

Comment: The two samples are of such different origin and quality that a
reliable comparison Iran vs. Iraq does not seem feasible!

NC-Laboratory Spiez

(Signed) Dr. A. Neiderhauser

Appendix V

ANALYSIS OF SAMPLES OBTAINED FROM IRAN AND IRAQ

FORSVARETS FORSKNINGSANSTALT
National Defence Research Institute
ABC Research Department (FOA 4)

6 May 1987

1. The samples were received in Umeå, Sweden, at 1 a.m., 3 May 1987.
2. The samples consisted of:

(a) Two plastic 100 ml vessels, labelled "IRAQ-BASRA 1 MAY 1987", each containing a capped 20 ml vessel embedded in charcoal. These inner vessels, labelled "No. 3 Iraq" and "No. 4 Iraq", were both filled with a grayish-brown dry clay, which was partly clotted;

(b) Two plastic 200 ml vessels numbered 3 and 4 and labelled "Avskrap ur bombrest" (scrapings from bomb residue), Tehran 870428". Embedded in activated charcoal in the containers were two capped 15 ml vessels, labelled 3 and 4. They were filled with various amounts of brownish-black "cakes", with a tar-like consistency, and sand;

(c) One plastic 200 ml vessel, labelled "Tehran 870428", containing two smaller vessels. Each of these vessels contained an adsorbent tube (XAD-2) wrapped in aluminium foil.

3. In dichloromethane Soxlet extracts of samples Nos. 3 and 4 from Iraq, mustard gas (bis-(2-chloroethyl)-sulfide) and its hydrolysis product thiodiglycol (bis-(2-hydroxyethyl)-sulfide) were identified by means of gas chromatography retention data and by comparison with mass spectra of the authentic substances.

By quantitative gas chromatographic analysis the concentration of mustard gas was calculated to $3 \mu\text{g} \cdot \text{g}^{-1}$ and $2 \mu\text{g} \cdot \text{g}^{-1}$ in samples Nos. 3 and 4 respectively. The concentration of thiodiglycol was calculated to $0.1 \text{ mg} \cdot \text{g}^{-1}$ in both samples.

4. In dichloromethane Soxlet extracts of samples Nos. 3 and 4 from Iran, mustard gas was identified by means of gas chromatography retention data and by comparison with mass spectra of authentic mustard gas.

Furthermore, the following compounds were tentatively identified, mainly on the basis of mass spectral data, as present in trace quantities in the extracts:

2-chloroethyl 2-hydroxyethyl sulfide
bis-(2-chloroethyl)-disulfide
bis-(2-chloroethyl)-sulfoxide
sesquimustard gas (1,2-bis-(2-chloroethylthio)ethane)
bis-(2-chloroethylthioethyl)-ether

By quantitative gas chromatographic analysis the concentration of mustard gas was calculated to $7 \text{ mg} \cdot \text{g}^{-1}$ and $3 \text{ mg} \cdot \text{g}^{-1}$ in sample Nos. 3 and 4 respectively.

5. In the diisopropyl ether extracts of the adsorbent tubes, mustard gas was identified by means of gas chromatographic retention data and by comparison with mass spectra of authentic mustard gas.

By quantitative gas chromatographic analysis the concentration of mustard gas in the air sampled was calculated to 8 and $30 \text{ mg} \cdot \text{m}^{-3}$ respectively.

National Defence Research Institute
Division of Chemistry

(Signed) Sten-Åke Fredriksson

(Signed) Maria Sandberg

6 May 1987

Appendix VI

USE OF CHEMICAL WARFARE AGENTS IN IRAN AND IRAQ

Agent	Iranian area		Iraqi area	
	Alleged use <u>a/</u>	Observed use <u>b/</u>	Alleged use <u>a/</u>	Observed use <u>b/</u>
Phosgene	No	No	Yes	Possible <u>c/</u>
Hydrogen cyanide	Yes	No	No	No
Mustard gas	Yes	Yes <u>d/</u>	Yes	Yes <u>d/</u>
Nerve agents	Yes	Possible <u>e/</u>	No	No

a/ By the relevant Iranian or Iraqi authorities.

b/ By the United Nations mission members.

c/ Clinical examination of patients indicated that they had been affected by an agent which irritated the bronchial tubes and alveolo, which might possibly have been phosgene.

d/ By clinical examination of patients and chemical analysis of samples.

e/ A video of patients taken shortly after an attack showed symptoms that might be related to nerve gas poisoning. By the time we examined the patients two weeks later the symptoms had disappeared.

Appendix VII

USE OF CHEMICAL WEAPONS IN IRAN AND IRAQ

Item	Iranian area		Iraqi area	
	Alleged use <u>a/</u>	Observed use <u>b/</u>	Alleged use <u>a/</u>	Observed use <u>b/</u>
Mortars	No	No	Yes	No
Artillery shells	Yes	Confirmed from damage and use of detector (CAM) <u>c/</u>	Yes	Possible <u>d/</u>
Rockets	Yes	90 mm and 122 mm items recovered <u>e/</u>	No	No
Aerial bombs	Yes	Bomb fragments sampled for chemical analysis	No	No

a/ By the relevant Iranian or Iraqi authorities.

b/ By the United Nations mission members.

c/ Two unexploded 155 mm shells examined in Tehran were shown to be conventional high explosives items, not chemical items as claimed.

d/ The sampling operation was conducted by Iraqi troops under United Nations mission observation using their own detection equipment.

e/ The 90 mm rocket is thought to be an air-to-surface missile and the 122 mm rocket a surface-to-surface missile from a multiple rocket launcher.
