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THE SECOND WORLD WAR
1939—1945
ARMY

SPECIAL WEAPONS AND TYPES OF WARFARE

VOLUME I—GAS WARFARE

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Excerpt

THE WAR OFFICE
1951

SECTION 4.—NERVE GASES

Nerve gases consist of a number of related substances, some of which are markedly more toxic than others of the group—although all are the most toxic war gases yet discovered.

"Tabun" was first discovered by a German chemist, Dr. Gebhardt Schrader, about 1936, during work on insecticides. "Sarin" was discovered as a result of further research on this group in 1938. The German War Ministry were impressed with their toxicity and put a large team of chemists on to study them. Plans for large scale production of "Tabun" were made in September, 1939. Initial production difficulties of "Tabun" were considerable; it was not until 1942 that the Germans got into large scale production at a specially erected factory at Dyhernfurth, with an output of 1,000 tons a month. In all, some 12,000 tons were manufactured. "Sarin" presented formidable production difficulties; only a pilot plant had been brought into operation by the end of hostilities. "Saman" was discovered in 1944. The Germans had only attempted laboratory preparation of this compound.

The existence of these gases was entirely unknown to us until the capture and examination of German 105-mm. Green Ring 3 H.E./chemical shells in April, 1945. Subsequently 250 kg. aircraft bombs with the same charging were found. That the Russians also know of the nerve gases must be assumed as certain. Although it appears that we captured the majority of stocks of German gas weapons, as well as the research establishment at Raubkammer (*see* Appendix XXIV), the "Tabun" factory at Dyhernfurth in Galacia is in the Russian Zone.

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Nerve gases are liquids of varying volatility; in the field they can be regarded as colourless. Both the liquid and vapour are lethal, although unless actually inhaled in droplets the danger from liquid is probably not great. The liquid has no blistering or irritant effect. The respirator affords complete protection to the eyes, throat and lungs, but the problem of detection has not yet been satisfactorily solved.

As our own investigation of this group of war gases only began after the cessation of hostilities, our knowledge at the time of writing is based largely on German information, which has been completely supplied to us, of the types of nerve gases which they had developed. Further exhaustive research of this group may produce even more toxic types. Owing to their lethal characteristics experiments on human beings are circumscribed. The only evidence on which to base lethal effects on humans is by extrapolation from animal results, and from the records of a few factory accidents which occurred in Germany.

The action on the body is on the nervous system. They give no warning of their presence by sensory irritation.

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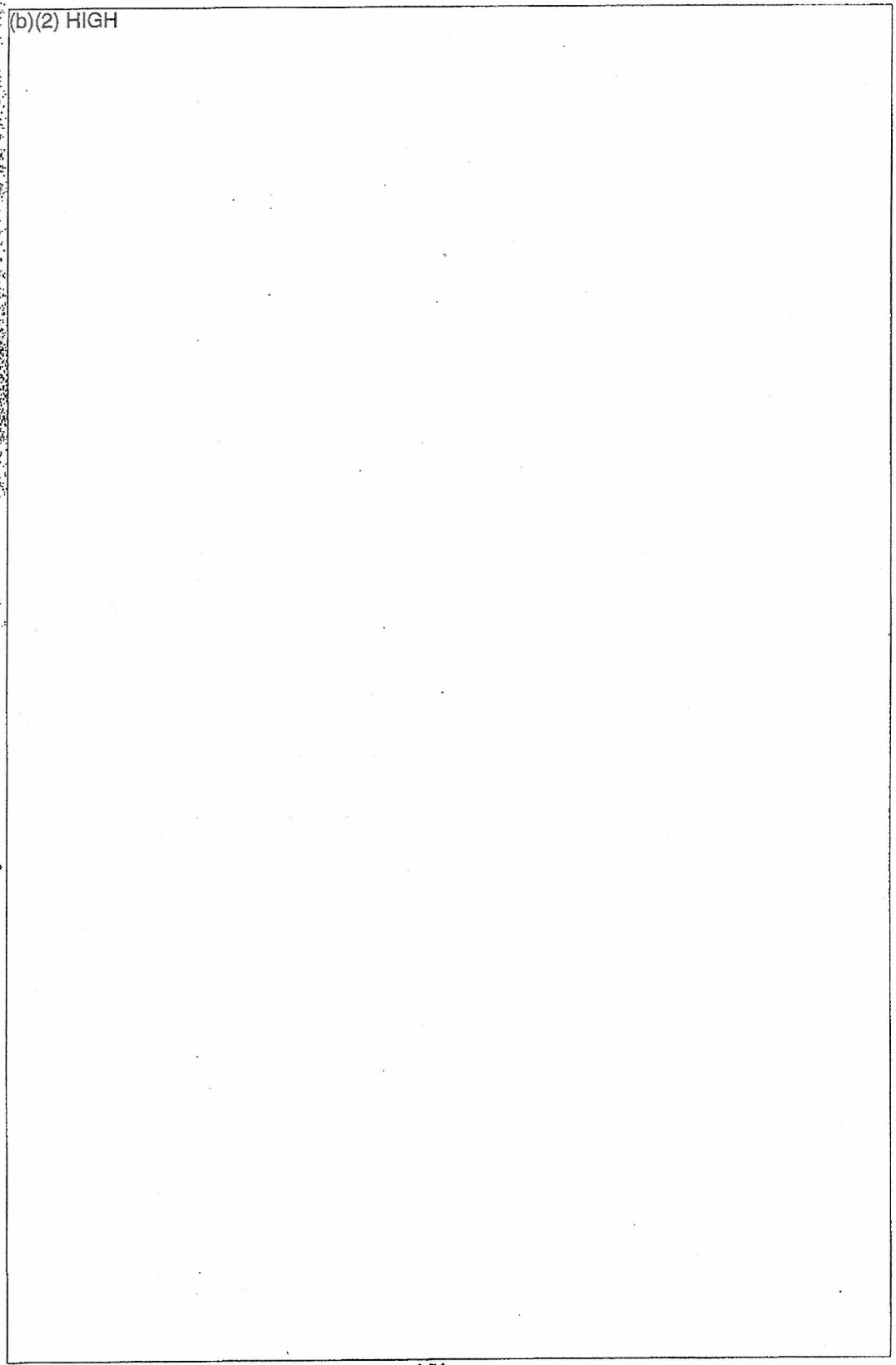

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Detection and recognition are difficult. The liquid reacts with detector paint and ground detectors, but such detectors cannot be relied on to detect the fine droplets of the initial cloud of an H.E./chemical shell. The papers in the Pocket Vapour Detector give no reaction, and there seems to be little chance up to the present of developing a detector which would be sufficiently quick and reliable to give the rapid warning necessary in the case of bombardment with H.E./chemical shell. A detector for use when the time factor is not so critical, *e.g.* to determine whether respirators can be removed, is a possibility, but is not available up to the time of writing (1947). Detection by smell cannot be relied on. Detection would therefore often be dependent on the earliest recognition of symptoms.

To date, the only answer would appear to be the wearing of the respirator for very long periods from the beginning of any heavy bombardment. There is need for the application of personal decontamination on the lines already taught for mustard gas, but existing anti-gas ointments are ineffective. A combined anti-nerve gas/anti-mustard gas ointment is a possibility. The early medical treatment of men showing initial symptoms would be necessary. Myosis can be relieved in about an hour by drops of atropine or hyocine in the eye. A man could not, however, be returned to duty immediately, since his sight might still be unreliable, and several hours must pass before it is known whether he has received a lethal dose or not. If the more severe symptoms then begin to evidence themselves, medical treatment is essential for a good chance of recovery. In our present state of knowledge, however, medical treatment is palliative rather than curative.

For decontamination, hosing, swabbing and aqueous bleach paste are efficacious, and boiling will decontaminate clothing.

The above is the résumé of the general effects of nerve gases. Had the Germans initiated gas warfare and used these gases against us there can be little doubt that the initial results would have been serious. Although the respirator gives complete protection from vapour to the eyes and lungs, the difficulties of recognition would have been considerable, and the danger from the liquid remained. Only battle experience would have shown the degree of effectiveness of these gases, but from laboratory experiment and extrapolation from animal results they obviously possess great potentialities for the future.

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At first sight it might appear that all other gases fade into the background. This is not necessarily so and, although it appears that phosgene will become a "back number," blister gases should continue to hold a place amongst the war gases for their harassing value arising from their long persistence, their insidious nature, their high rate of casualty production, and the fact that in both liquid and vapour form they affect the whole of the body surface.

An examination of Intelligence reports since before the war shows that although there were a few reports in 1943–44 which can now be interpreted to refer to nerve gases, there was nothing which gave a tangible clue to their composition or to their development by the Germans.