

parts of the world). They are peripheral sensory irritant materials which interact, at the site of action (contamination), with sensory receptors in the skin and mucosae, causing local uncomfortable sensation with related reflex effects (Table 2). The uncomfortable sensation and reflex effects hinder the performance of co-ordinated activities and this forms the basis for the short-term incapacitating or harassing properties of these chemical substances. We would like to underline that what is characteristic of these substances is the prompt onset of effect upon exposure and the rapid disappearance of signs and symptoms after the period of exposure.

On the basis of exposure to aerosols or smokes, sensory irritants have been broadly classified into those for which the principal site of action is the upper respiratory tract ("sternutators"), and those having their main effect on the eye ("lachrymators" or, euphemistically, "tear gases").

The most important members of this group are:

- O-chlorobenzylidenemalononitrile (CS) ("Irritant agent")
- Dibenzoxazepine (CR) ("Irritant agent")
- Chloracetophenone (CN) ("Tear gas")
- Diphenylaminochlorarsine (DM) ("Sickening agent", "Vomiting agent").

On the basis of the onset of symptoms (several minutes after exposure) and recovery time (several hours), DM is unsuitable as a short-term incapacitating agent.

LONG-TERM INCAPACITANTS

Long-term incapacitants may be defined as chemical compounds whose application causes temporary illness or induces temporary mental or physical disability, the effect of which may be delayed in onset and whose duration greatly exceeds the exposure period. These incapacitating agents could be classified as physical incapacitants or mental incapacitants, according to whether they act predominantly on the physical or mental activities of the subject.

Physical incapacitants

The effects of physical incapacitants - that is to say, agents which do not depend for their incapacitating effects solely upon action on the central nervous system, or on military performance - are more predictable than those with dominant action on the central nervous system ("psychochemicals", "mental incapacitating agents"). On the other hand, physical incapacitants, i.e. agents which disrupt the basic life-sustaining system of the body and thus prevent the execution of physical activity (lower blood pressure, paralysis of skeletal muscles, respiratory depression, etc.) almost invariably have a low margin of safety between the effective (incapacitating) and possible lethal doses and thus do not fulfil the basic purpose of an incapacitating agent which is to reduce military effectiveness without endangering life.

Possible mechanisms of physical incapacitation are many, but the mentioned criterion of low margin of safety means that no practical physical incapacitant is known at present, although the vomiting agent DM is described as a physical incapacitant.