ADVANCES IN SCIENCE AND TECHNOLOGY: CNS-ACTING CHEMICALS

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1. Chemical Weapons

- *Article II.1 "Chemical Weapons" means…*
  - (a) Toxic chemicals and their precursors, except where intended for purposes not prohibited under the Convention, as long as the types and quantities are consistent with such purposes.
- *Article II.2 "Toxic Chemical" means:*
  - Any chemical which through its chemical action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals. This includes all such chemicals, regardless of their origin or method of production, and regardless of whether they are produced in facilities, in munitions or elsewhere.

2. Riot Control and Law Enforcement

- *Article II.7 "Riot Control Agent" means:*
  - Any chemical not listed in a Schedule, which can produce rapidly in humans sensory irritation or disabling physical effects which disappear within a short time following termination of exposure.
  - The Scientific Advisory Board has listed riot control agents that fit these criteria.
- *Article II.9 "Purposes Not Prohibited Under this Convention" means:*
  - (d) Law enforcement including riot control purposes.

3. Article II.9(d)

- *Meaning?*
  - Law enforcement is a larger category than domestic riot control purposes. Therefore there could be allowable law enforcement chemical agents.
- *Implications?*
  - Law enforcement would imply incapacitating agents attacking the CNS.
  - Very dangerous chemicals could be used in law enforcement operations.
  - Efforts to prevent the re-emergence of chemical weapons could be frustrated.

4. CNS-Acting Chemicals Poster

- *Office of the OPCW Science Policy Advisor, 2019*
  - Dexmedetomidine:
    - Presynaptic activation of alpha2-adrenoreceptors inhibiting production of noradrenaline.
  - Fentanyls:
    - In the CNS, fentanyls bind to opioid receptors to depress functions.
  - BZ:
    - Acts as a competitive inhibitor of the neurotransmitter acetylcholine producing stupor, ataxia, and hallucinations.

5. ICRC (2018) RC-4/NAT.21

- *Statement*
  - At the First Review Conference in 2003 the ICRC expressed its alarm about the interest shown by police, security and armed forces in using certain highly toxic chemicals as weapons – so-called "incapacitating chemical agents" or "central nervous system (CNS)-acting chemicals". The ICRC is of the view that the use of toxic chemicals as weapons for law-enforcement purposes should be limited to riot control agents only, and continues to call on each State Party to join those that have already adopted national policies and legislation to that effect.

6. USA (2020) EC-93/NAT.14

- *Statement*
  - At the Ninety-Second Session of the Council in October 2019, the United States together with Australia, Switzerland and nineteen other co-sponsors launched an initiative calling for the adoption of a set of decisions. As a two-step process, the Council would recommend to the Twenty-Fifth Session of the Conference in November 2020 that it formally decide that aerosolized CNS-acting chemicals are inconsistent with law enforcement as a purpose not prohibited by the Convention. To be clear, this set of decisions would not impose any new obligations on State Parties nor require any changes to the Convention. Instead, the decisions would make clear the State Parties' understanding that the Convention prohibits the aerosolized use of CNS-acting chemicals in law enforcement…

7. Russia (2020) EC-93/NAT.6

- *National Document*
  - Taking into account the status of the question on banning CNS-acting chemicals, we find it necessary to conduct an extensive study…using the following comprehensive approach:
    - 1. Take measures to clarify the use of riot control agents…
    - 2. Prepare recommendations on an extensive set of terms and use thereof within the framework of the Convention, in particular: "central nervous system-acting chemicals" (including aerosolized form); "law enforcement purposes"; "temporary disabling effect".
    - According to the procedure set out in Article XV, prepare the corresponding amendments to the Convention, including Article II…

8. The Draft Decision in 2020

- EC-93 (March)
  - The Council considered the draft decision and decided to defer the matter until its next regular session.
- EC- 94 (July)
  - Further to its consideration of this issue at its previous session, the Council decided to defer the matter until its next regular session.
- EC-95 (October)
  - The Council decided to defer the matter for further consideration.

9. A Possible Compromise?

- Pakistan Statement EC-95 (October)
  - Last year we all came together in a great show of unity to add certain chemicals in Schedule 1 of the Annex on Chemicals in the Convention…. We believe that the issue of the CNS acting chemicals may be dealt with in the same manner - i.e. through consensus. If it entails more debate among us, we must do it; if it entails giving up our apparently doctrinaire positions, we must abandon them in the interest of a genuine compromise which is beneficial to all…
- States that supported action in 2017 (C-22/NAT.5) but not the decision in October 2020 (EC-95/4)
  - Belgium, Brazil, Chile, Ecuador, Germany, Ireland, New Zealand, Senegal, UK

10. Dual-Use Neuroscience?

- *US NIH (2014) BRAIN 2025: A Scientific Vision*
  - *In considering these goals and the current state of neuroscience, the working group identified the analysis of circuits of interacting neurons as being particularly rich in opportunity, with potential for revolutionary advances.*
- *An Example: Narcolepsy*
  - *Cause unknown in 1998 when two papers led to the discovery of a neuropeptide - orexin - involved in sleep/wake regulation.*
  - *Loss of orexin-producing cells, probably via an autoimmunity process, causes narcolepsy. Based on this new understanding a novel drug for insomnia was licensed recently.*

11. Some References

- 1. Timperley, C. (2017) *Central Nervous System-Acting Chemicals: The Scientific Perspective*. Presentation to CSP22, The Hague, 28th November.
- 2. Nixdorff, K., Borisova, T., Komisarenko, S. and Dando, M. R. (2018) Dual-use nano-neurotechnology: An assessment of the implications of trends in science and technology. *Politics and the Life Sciences,* Fall, **37** (2), 181 – 202.
- 3. Crowley, M. (2016) *Chemical Control: Regulation of Incapacitating Chemical Agent Weapons, Riot Control Agents and their Means of Delivery*. Palgrave, Basingstoke.
- 4. Crowley, M., Dando, M. R. and Shang, L. (2018) *Preventing Chemical Weapons: Arms Control and Disarmament as the Sciences Converge*. Royal Society of Chemistry, London.
- 5. Crowley, M., Shang, L. and Dando, M. R. (2018) Preventing chemical weapons as sciences converge: Focus must extend beyond 20th-century technologies. *Science*, **362**(6416), *753-755*.
- 6. Dando, M. R. (2015) *Neuroscience and the Future of Chemical-Biological Weapons*. Palgrave, Basingstoke.
- 7. Dando, M. R. (2020) *Neuroscience and the Problem of Dual Use: Neuroethics in the New Brain Projects*. Springer/Nature, Switzerland.