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# TO WHAT EXTENT WAS THE REVIEW OF SCIENCE AND TECHNOLOGY MADE MORE EFFECTIVE AND EFFICIENT AT THE 2013 MEETING OF BTWC STATES PARTIES?

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POLICY PAPER 5

BIOCHEMICAL SECURITY 2030 PROJECT

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## EXECUTIVE SUMMARY

At the 2011 Seventh Review Conference of the Biological and Toxin Weapons Convention State Parties agreed to make changes to the third Intersessional Process (ISP) between 2012 and 2015. The changes included the decision to have a Standing Agenda Item (SAI) to review developments in science and technology relevant to the Convention. Understandably, this new method of dealing with the implications of ongoing rapid advances in the life and associated sciences did not immediately make the review of science and technology more effective and efficient. However, by the December 2013 Meeting of States Parties (MSP) the ISP was at the halfway point in the implementation of the new process. This paper therefore investigates whether significant improvements were made in the review of science and technology at the December 2013 meeting.

The paper begins by briefly comparing the action-orientated ideas for dealing with advances in relevant science and technology put forward by some State Parties as part of the Seventh Review conference. These submissions provided a good part of the basis for the discussions which led to the adoption of science and technology as a SAI. It is in this context, that the paper then outlines the extent to which treatment of science and technology as a SAI proved unsatisfactory within the first (2012) ISP meeting. To this end, the paper sets out a conceptual scheme that might have been expected to produce effective and efficient outcomes from the ISP in 2013. It is noted that the 2013 Meeting of Experts did not work in that way, or achieve such results, despite many similar ideas for an effective and efficient system having been put forward by a wide range of States Parties at the Seventh Review Conference. It is then suggested that a major question for the 2013 Meeting of States Parties was whether it could do anything significant to improve the operation of the SAI on science and technology or whether it would allow the same current unsatisfactory process to continue.

The paper goes on to show that some State Parties continued to demonstrate, for example in regard to dual-use education for life scientists, how good progress could indeed be made. Other State Parties, however, clearly did not see the review of science and technology as requiring that degree of urgent action. The net result was that although the report of the Meeting of State Parties added some new material to that agreed in December 2012 in regard to developments in science and technology, these lacked the specificity and action-orientation that would have been produced by a more effective and efficient mechanism.

The paper concludes by initially considering the issue of Gain of Function experiments with dangerous viruses and points out the widely-held view that the Biological and Toxin Weapons Convention proceedings, as presently constructed, are not able to contribute effectively to the development of means of dealing with this obviously important and relevant concern. It is then suggested that this inadequacy, on present evidence, is unlikely to change before the Eighth Review Conference in 2016, but the paper ends by noting that efforts to make progress in the lead up to the Eight Review Conference continue in the preparations for the 2014 meetings of States Parties in Geneva.

Finally this paper points towards three key recommendations:

1. In the 2014 and 2015 meetings of the BTWC States Parties should now identify key scientific and technological issues of relevance to the Convention. These include the need to deal with dual-use experiments as well as the need for awareness raising and education of life scientists. States Parties should also define what actions can usefully be taken and reported to the 8th Review Conference in 2016 in regard to these key issues.
2. Individual States Parties should now take practical steps at national level to deal with what they consider to be key scientific and technological issues. These steps need to take place in a timeframe that allows reporting of outcomes to the 8th Review Conference.
3. International and national scientific associations should accept some responsibility for providing input to the 8th Review Conference. Their input should be reports on practical actions related to key scientific and technological developments relevant to the Convention.

*"While the participants at various BWC events, including the review conferences and intersessional meetings, have continued to emphasize that the progress in science and technology has not invalidated the basic articles of the convention, we must be concerned about the BWC having the structures, organizations and processes to adequately monitor, track, and address the changes that are unfolding in this emerging Age of Biotechnology..."*

Daniel M. Gerstein, Deputy Under Secretary for Science and Technology, Department of Homeland Security, United States. Page 52 in Gerstein, D. M. (2013) *National Security and Arms Control in the Age of Biotechnology: The Biological Weapons Convention*, Rowman & Littlefield, Lanham.

## 1. INTRODUCTION: THE FAILURE OF THE THIRD ISP IN 2012

It took almost one hundred years from Darwin's *Origin of Species* to Watson and Crick's discovery of the mechanism of heredity in the early 1950s, so it is perhaps not surprising that at the First Five-Year Review Conference of the Biological and Toxin Weapons Convention (BTWC) in 1980 the States Parties were able to conclude that Article I had:

"...proved sufficiently comprehensive to have covered recent scientific and technological developments relevant to the convention."

However, the revolution in the life sciences that produced the description of the human genome at the turn of the millennium was already getting underway, and at the Second Review Conference in 1986 the possible production of toxins by genetic engineering led to States Parties making it clear that the Convention applied to all toxins whatever their origin or mode of production.<sup>1</sup>

Concerns about the impact of scientific and technological advances on the Convention increased, and having noted some of the particular fields of concern in previous Review Conferences the Sixth Review Conference in 2006 concluded:<sup>2</sup>

"The Conference reaffirms that Article I applies to all scientific and technological developments in the life sciences and in other fields of science relevant to the Convention."

By the time of the Seventh Review Conference in 2011 there was also a clear recognition that the revolution in the life sciences had impacts right across the Articles of the Convention and not just on Article I.<sup>3</sup> However, as one review concluded after the second Intersessional Process (ISP) Meetings of 2007-2010:<sup>4</sup>

"Despite the increased involvement of scientists in the BWC meetings and the focus on specific topics for discussion it was difficult to detect a significant change in the output of the Review Conferences in the new millennium..."

The review continued:

"...the scope of the Convention was clarified but there was no consideration of what to do about the scope and pace of scientific and technological change or subsequent action..."

Thus there was a widespread view that the 2011 Seventh Review Conference needed to agree a better method of dealing with the problem of scientific and technological change.<sup>5</sup>

Some states put forward proposals for the working of the ISP from 2012-2015 that were clearly *action oriented*. The UK, for example, proposed the establishment of three Task Groups, one of which would be concerned with science and technology.<sup>6</sup> Each Task Group would have a leader who would ideally remain in post for the full four years and each leader would serve as chair of one Annual Meeting of States Parties. The clear intention was to suggest a system that could produce serious reviews:

"...Papers and presentations will be commissioned in good time before the next meeting and delegations invited to comment at least one month before the meeting."

and there would be follow-up to the conclusions of the reviews:

"The Task Group should focus on action, which could entail regular reporting on progress in implementing obligations: follow-up on requirements and recommendations/key points from previous intersessional rounds; discussion of problems and possible solutions; recommendations for agreed actions to be completed by State Parties by specified dates; review of actions taken by other international organisations relevant to the topic(s) in hand; and identifying opportunities for cooperation and collaboration on advancing specific agenda items."

The Task Groups would provide a report to the Annual Meeting of States Parties each year which would "decide on any recommendations that might emerge from the Task Groups" or modify the mandates of Task Groups if this was found necessary.

This business-like, action-orientated approach was not, however, the outcome of the "modestly" successful Seventh Review Conference.<sup>7</sup> The result, in fact, was a small incremental change in the way that science and technology were to be considered in the new ISP. Crucially, decision-making powers were still reserved to the next Review Conference in 2016. Moreover, whilst science and technology together were selected as one of the three Standing Agenda Items (SAIs) for the meetings, the way the meetings were organised was flawed. Firstly, there were far too many items to be dealt with in the science and technology SAI, a problem compounded by the fact that there was no provision for States Parties to deal with science and technology collectively between the meetings in Geneva - and these meetings remained at only one week each for the Meeting of Experts and the Meeting of States Parties. Furthermore, there was a clear danger that related items such as the education of scientists - which was relevant to all three SAIs - would be dealt with in a fragmentary manner under each SAI rather than in an integrated way across all three.

To make matters worse, the 2012 Meeting of Experts came soon after the Review Conference and at a time when another major arms control conference was taking place in New York. So insufficient time and resources were available to find ways around these flaws. The result was that science and technology were dealt with at the Meeting of Experts in a way plainly stated by South Africa - in a Working Paper for the Meeting of States Parties - that was technically unsatisfactory.

Consideration of the Working Paper then led to an animated discussion at the Meeting of States Parties.<sup>8</sup> So it was against this unsatisfactory background that preparations for the 2013 round of meetings began.

## 2. THE 2013 ISP: CONCEPTUAL CONSIDERATIONS

To be successful a science and technology review might be expected to:

- i) assess the probable trajectory of developments in a particular field over the near to medium term (say for the next 5-10 years);
- ii) identify issues that could be of benefit or risk to the BTWC within these developments;
- iii) define and discuss the pros and cons of a range of policies that could be used to address such potential benefits and risks;
- iv) decide what policies amongst that range of possibilities might be most beneficial for the future of the Convention; and
- v) arrange for the pilot implementation and monitoring of such policies so that they could be carefully considered at the Eighth Review Conference in order that decisions could be taken about how to strengthen the Convention on the basis of firm empirical evidence.

It cannot be argued that such an approach is impossible because there are a variety of examples available where such biosecurity issues of relevance to the Convention have been dealt with effectively in that empirical action-oriented approach.

Since most advances in science and technology are incremental rather than paradigm-changing, it is not impossible to make reasonable assessments of trajectories, particularly as significant developments are likely to be dependent on major funding initiatives.<sup>9</sup> Moreover, it is possible to analyse a range of scientific and technological developments and pick out which are of most critical concern for the BTWC. For example, prior to the Seventh Review Conference, the convergence of biology and chemistry; synthetic biology; systems biology; the explosion of computational power and the use of internet links; drug delivery techniques; and microbial forensics were identified as areas of advance that should be carefully examined for their impacts.<sup>10</sup>

In regard to policies to protect life sciences from misuse most debate has taken place in the United States in regard to dual-use research of concern and, after the controversy about Gain-of-Function (GOF) experiments over the last two years, has led to new regulations being implemented by the National Institutes of Health.<sup>11</sup> Yet it is not only government that has been able to debate and implement policies designed to protect civil life science from hostile misuse. Maurer has cogently argued that the DNA synthesis industry has been able to institute means of checking orders for sequences that might be of concern and that other high technology life science industries such as pharmaceuticals, where "manufacturers face massive fixed-costs investments, sell to large buyers and face risk from intelligent adversaries" may well also be able to develop such private biosecurity standards.<sup>12</sup> Furthermore, well-informed scientists have shown that they are capable of acting

informally to protect their work as in the recent case of a new form of botulinum toxin where crucial information was withheld from publication, with the agreement of the journal concerned, pending the development of effective countermeasures.<sup>13</sup>

Yet despite such wide-ranging possibilities, an analysis of the 2013 BTWC Meeting of Experts concluded that the presentations, statements, working papers and interventions:<sup>14</sup>

"...for the most part reflected only generalities concerning the topic under consideration, with very few examples of suggestions for concrete action..."

Indeed, at one point the Chair "complained that the statements were not offering enough concrete proposals that might serve as a guide for the MSP [Meeting of States Parties]." This, of course, reiterated the view put forward in regard to the 2012 Meeting of Experts by South Africa:<sup>15</sup>

"Some excellent presentations were given by experts in which very complicated scientific issues were explained in simple terms. However, there was no substantive engagement on these presentations and therefore, opportunities to come to useful common understandings were lost. A number of very useful discussions took place during lunch time side events, but they were not attended by all delegations or part of the formal MXP [Meeting of Experts]"

Airing of this viewpoint led to an animated discussion at the Meeting of States Parties in 2012 reflected the fact that many States had put forward ideas for a more useful structure of the science and technology review at the 2011 Seventh Review Conference.

India, for example, stated in its Working Paper No. 3 of 11 October 2011:<sup>16</sup>

"...it is proposed that the Seventh Review Conference take a decision regarding structured and systematic review of S & T developments within the framework of the Convention. The aim is to build consensus among Member States based on a thorough review of developments in life sciences and biotechnology that are of relevance to the BWC, consistent with Article XII of the Convention."

China echoed this theme of the need for greater efficiency in the Intersessional Process:<sup>17</sup>

"In order to promote greater flexibility and efficiency, China supports making appropriate improvements in the intersessional process currently in use. Experts meetings can continue to be held, or working groups open to all States Parties can be set up, to carry out specialized discussions of such topics of broad concern as...assessment of the impact of scientific and technical development.... Results of the discussions should be made available to the meetings of States Parties, which would in turn submit a report on them to the subsequent Review Conference..."

As we have seen, other States Parties, like the UK, were even more specific about what might be done to improve the ISP after the Seventh Review Conference. For example, Australia and Japan suggested that:<sup>18</sup>

"Our proposal is that the ISP be refined by the Review Conference through the establishment of a number of working groups..."

One such group would deal with an annual review of advances in science and technology relevant to the BWC and education and awareness-raising on dual-use issues. The working paper further proposed that:

"...each working group be open-ended with its meetings scheduled over seven days in August, which would, in effect, restructure the annual Meeting of Experts (MX) to make it more flexible and adaptable..."

Following the Meeting of Experts the paper also proposed that:

"...the facilitator of each working group would prepare a draft annual report for consideration and adoption at the subsequent MSP [Meeting of States Parties]. The draft report would be circulated prior to the MSP to allow States Parties to consider any decisions recommended and actions required..."

One decision would be the issues to be considered during the following year, and any decisions taken would be subject to consideration and review at the next Review Conference.

Germany looked at to how the Implementation Support Unit (ISU) might be strengthened in order to better support the whole process:<sup>19</sup>

"...The 'Intersessional Bureau' could assist the ISU and chairman to identify and select experts and representatives from academia and industry to participate in meetings of the reshaped intersessional process and advise the ISU and chairman in organizational matters..."

The bureau would have wide representation from States Parties:

"...from the regional groups, including group coordinators, the three depositaries and the designate chairman as members and the head of the ISU as its secretary..."

Crucially, this bureau would meet two or three times before the Meeting of Experts and thus bridge the long gap in time between the December MSP and the August MXP of the following year.

South Africa, in a paper on future planning, essentially argued for putting the horse back in front of the cart rather than *vice versa*:<sup>20</sup>

"The main restriction on ISU activities has been human and financial resources. This restriction is mainly due to the fact that the ISU budget and structure for the last five years was based on assumptions rather than proper planning, which resulted in underestimation of activities as well as costs..."

South Africa suggested that this lack of planning was in turn caused by the lack of information and time to attend to the issue at the preceding Sixth Review Conference. It believed that at the Seventh Review Conference there would again be a lack of time and information to deal with this critical issue. Thus it argued that the Review Conference should decide on the role and functions of the ISU and then the appropriate budget and structure be agreed by States Parties later.

In addition, further Working Papers by the UK and South Africa argued quite specifically that the ISP meetings should have decision-making capabilities. The UK stated:<sup>21</sup>

"...we argue that future expert and State Party meetings should be able to make decisions of an appropriate nature, to ensure that 'effective action' is taken on these issues where there is clearly consensus that this is the proper course to take..."

and South Africa stated:<sup>22</sup>

"It is, therefore, clear that the intersessional process should be utilised to work on specific substantial issues. This will require that the Meeting of States Parties (MSP) have decision-making powers while the experts meeting should concentrate on examining specific issues for the MSP to decide upon..."

So the Seventh Review Conference had before it a wide range of the necessary ideas and wide support for a structured and systematic review of scientific and technological developments in the intersessional process to be crafted. These ideas included designation of the topic for the year by the previous year's meeting of States Parties; organisational meetings by an intersessional bureau prior to the meeting of experts; a better staffed and funded ISU to support the intersessional process; appointment of a facilitator to guide the science and technology review; an open-ended working group at the meeting of experts; and production and presentation of a facilitator's report in advance of the meeting of States Parties where appropriate decisions could be made on issues where there was a clear consensus that something needed to be done.

As we know, little of this survived in the Seventh Review Conference endgame<sup>23</sup> with the result that the third ISP to date had not been able to make much progress on the crucial issue of the science and technology review. The question at issue for the Meeting of States Parties in December 2013, therefore, was whether anything could be done to make the review more effective and efficient.

### 3. CONTINUED EFFORTS TO ACHIEVE PROGRESS

In December 2012 Switzerland argued that it was vital that the BTWC did not lose touch with the rapidly advancing life sciences, Ambassador Schmid stating that:<sup>24</sup>

"...we continue to emphasise that, in our view, it is necessary to set up an effective mechanism that provides for a regular and systematic review of relevant developments in the life sciences..."

In August 2013 Switzerland reiterated this point and arranged for the former Chair of the OPCW's Scientific Advisory Board to address a side event<sup>25</sup> in order to:<sup>26</sup>

"...share with us his views on the functioning, value and impact of such a standing body in the framework of the CWC, and discuss the potential value that an instrument performing similar functions may add to the BWC and its community..."

Furthermore, Switzerland suggested that a Working Paper by Australia, Japan and New Zealand for the Seventh Review Conference<sup>27</sup> could serve as a good starting point for such a discussion. This joint Working Paper put forward a sensible structure for the annual review of relevant science and technology in a five-step process (Table 1) and Switzerland's general position was reflected in the Chair's synthesis report<sup>28</sup> under section E, paragraph 15 (Table 2).

**Table 1:** How could an effective science and technology review be structured?\*

- (a) Each BWC Meeting of States Parties (MSP) would identify one or more S&T topics to be reviewed in the following year. The topic for review in 2012 would need to be decided by the Review Conference in December. For example, the issue of synthetic biology could be examined.
- (b) The MSP would invite independent international scientific organisations (ISOs), including IAP [InterAcademy Panel], to prepare factual reviews of topic(s), with input from national academies of science and scientific unions in the life sciences.
- (c) ISO representatives would discuss their factual reviews of topic(s) with States Parties during sessions of the S&T Working Group at the subsequent Meeting of Experts held in August.
- (d) States Parties at the S&T Working Group sessions would then consider implications for the BWC of the advances in the topic(s). The S&T Working Group Facilitator, appointed by the States Parties for the duration of the 2012-2015 intersessional period, would prepare a report, reflecting the factual reviews and the views of States Parties' experts but not necessarily consensus.
- (e) The S&T Working Group Facilitator's Report would be circulated prior to the subsequent MSP to allow States Parties to consider any actions required. Actions taken by the MSP relevant to the implementation and operation of the BWC arising from the S&T Working Group would be subject to review at the subsequent Review Conference. The cycle would then recommence, with the MSP developing particular S&T Topic(s) to be reviewed in the following year.

\* From: Australia, Japan and New Zealand (2011) *Proposal for the annual review of advances in science and technology relevant to the Biological Weapons Convention*. BWC/CONF.VII/WP.13

**Table 2:** Other science and technology developments of relevance to the Convention\*

15. Recognizing the importance of thoroughly and effectively reviewing science and technology developments relevant to the Convention, and of keeping pace with rapid change in a wide range of fields, States Parties should consider ways of establishing a more systematic and comprehensive means of review. Possibilities could include:

- (a) A board to provide science advice, similar to the Scientific Advisory Board of the CWC, or based on a different model;
- (b) An open-ended working group to consider the implications of advances in science and technology, including the convergence of chemistry and biology;
- (c) A requirement that whenever there are national or international meetings addressing science and technology developments, a summary should be prepared on the implications for the BWC, and submitted by the hosting State Party.

\* From: Chairman (2013) *Synthesis of considerations, lessons, perspectives, recommendations, conclusions and proposals drawn from the presentations, statements, working papers and interventions on the topic under discussion at the Meeting of Experts*. Annex to the letter from the Chairman

Prior to the Meeting of States Parties a letter from the Chair made clear that she considered that the Third Intersessional Process differed from the previous two in that the Standing Agenda Items brought recurrent topics each year and that a new way of dealing with the meeting's results was required.<sup>29</sup> In particular, she remarked:

"I think it is useful to look ahead at the end of the intersessional process and decide now what final product we want to provide to the Eighth Review Conference. When we know this, we can work backwards from there to determine how we could best structure this year's report to bring us closer to that goal."

The Chair was careful not to put forward any specific proposals of her own but clearly the possibility of change was in the air. The question that remained in regard to the science and technology review was whether States Parties were prepared to move to make use of a more effective and efficient process in 2014 and 2015 or whether they would insist on maintaining the obviously ineffective and inefficient process agreed in 2011 through to the Eighth Review Conference.

#### 4. PREPARATIONS FOR THE MEETING OF STATES PARTIES 2013

The Working Paper submitted by Australia, Japan and New Zealand for the Seventh Review Conference set out a specific five-step process by which the annual review of science and technology might have been able to make significant progress.<sup>30</sup> In short (Table 1), each Meeting of States Parties would specify topics for the review in the following year (Step 1). Then the Meeting of States Parties would invite international scientific organisations (such as the InterAcademy Panel) to prepare factual reviews of these topics (Step 2). The representatives of such organisations would then discuss their factual reviews with the Science and Technology Working Group at the Meeting of Experts (Step 3). The Facilitator of the Science and Technology Working Group, who would hold the appointment throughout the Intersessional period 2012-2015, would prepare a report of the factual findings and of what States Parties considered to be the implications for the Convention (Step 4). Finally, this report would be circulated to States Parties in advance of the Meeting of States Parties and any actions taken would be subject to review at the next Review Conference (Step 5). The process would then be repeated for the next year.

Prior to the 2013 Meeting of States Parties at least three papers gave consideration to what might be done to improve the Intersessional process, including the review of science and technology. A Joint Working Paper by Australia and six other countries considered how to move from consensus, when that was achieved, to effective action.<sup>31</sup> The paper argued that in order to promote effective action, States Parties needed to "identify and address" issues where:

"There is something new to say...

There is enough agreement that something specific can be said....[and]

There is something for States Parties to do..."

Using this set of principles, these States reviewed the Chairman's synthesis paper and produced suggestions for each of the three Standing Agenda Items where progress might be possible.

In regard to the review of science and technology they suggested that the problem of dual-use research had been a major focus of discussion and that there appeared to be "significant areas of potential agreement that could provide the basis for useful common understandings." And this led them to suggest that States Parties might be able to agree on the value of three understandings (Table 3). They also made suggestions about how scientific experts and diplomats might interact more effectively in meetings during the InterSessional Process. The paper also stressed the need for actions to prohibit and *prevent* anyone from acquiring or developing biological weapons as the Convention requires and, in that context, stated:

"...They [States Parties] have also agreed on the value of complementary outreach and education measures and the importance of regular review and updating of such measures..."

And amongst the suggestions in regard to the Standing Agenda Item on National Implementation the provision and regular updating on such preventive measures was noted as another possible common understanding.

**Table 3:** Suggested common understandings on dual-use research\*

(a) Developing appropriate national oversight measures to identify and manage such risks; such measures should be proportional, taking account both risks and benefits;

(b) Undertaking efforts to engage the scientific community, research funding organisations and, where appropriate, industry, in dialogue about how best to identify and manage DURC [Dual-Use Research of Concern]; and

(c) Sharing information about oversight frameworks, guiding principles, and practical experience with other States Parties.

\* From: Australia, Canada, France, Germany, Netherlands, the United Kingdom and the United States (2013) *Getting past yes: Moving from consensus text to effective action*. BWC/MSP/WP.4.

The United States submitted a paper, *Strengthening National Implementation*, which, in part, further emphasised this point.<sup>32</sup> It noted that the Seventh Review Conference had:

"...encourage[d] the consideration of development of appropriate arrangements to promote awareness among relevant professionals in the private and public sectors..."

and called on States Parties to:

"...promote the development of training and education programs for those granted access to biological agents and toxins relevant to the Convention and for those with the knowledge or capacity to modify such agents and toxins..."

and furthermore:

"...encourage[d] the promotion of a culture of responsibility amongst relevant national professionals and the voluntary development, adoption and promulgation of codes of conduct."

Here, at least, at the intersection of developments in science and technology and the requirements for national implementation on oversight systems, codes of conduct and their underpinning by awareness-raising and education programmes, there has surely been enough discussion and agreement for *action* to be taken.

Diplomacy, however, moves at a different pace in regard to the BTWC. A further Working Paper by Switzerland,<sup>33</sup> a country which clearly wants to see more robust and effective treatment of the implications of advances in science and technology, does not call for a restructuring of the review now, but states that:

"...we believe that it is both important and timely to start a discussion leading up to the Eighth Review Conference on how we could achieve a more effective review of scientific and technological developments, as well as on the potential value such a dedicated process may add to the BWC and its community."

To that end Switzerland offered to convene a cross-regional group to exchange views and possibly elaborate a joint paper on the concept for the Eighth Review Conference. So it was with such limited expectations that the Meeting of States Parties began on 9 December, 2013.

## 5. PROCEEDINGS AT THE 2013 MEETING OF STATES PARTIES

In the opening statements at the start of the Meeting of States Parties there were numerous mentions of the importance of the science and technology review and of the need to improve it. India, for example, stated:<sup>34</sup>

"India believes that the standing agenda item on review of S & T developments is important for States Parties to keep pace with the rapid developments in biological science and technology which might impact the implementation of the Convention..."

and, further, that:

"...India would also be willing to make a contribution to the discussion on exploring the best way of conducting S & T review under the Convention in the run up to the next Review Conference, recalling the Working Paper submitted by India at the last Review Conference."

Similarly, China noted:<sup>35</sup>

"Timely assessing the impacts of the developments in bioscience and biotechnology on the Convention, preventing the misuse of bioscience and biotechnology, as well as strengthening biosafety and biosecurity and sharing experiences and practices of

management, are beneficial to the promotion of the effective implementation of the Convention..."

There were, however, contrary opinions expressed forcefully. Brazil, for example, stated that it:<sup>36</sup>

"...cannot accept the reference, in Section II of the synthesis paper, to 'advances in technologies that make vaccine production simpler, faster, cheaper and more efficient' as a development with potential for uses contrary to the provisions of the BWC..."

Whilst accepting the obvious importance of vaccine development, particularly in developing countries, antipathy to the view that such advances needed to be considered in relation to potential misuse was surprising in view of the importance attached to vaccine facilities in the negotiations aimed at strengthening the BTWC during the 1990s.<sup>37</sup>

Of direct relevance to this paper, Brazil also stated:<sup>38</sup>

"With reference to the proposal of establishing an open-ended working group to consider the implications of advances in science and technology, including the convergence of chemistry and biology, *my delegation is not convinced of the need to establish such a working group*. Not all States Parties have sufficient financial and human resources to follow these initiatives. Besides, *it is not clear why the debate on this matter should take place in a working group*, rather than in the context of regular meetings of experts." [emphases added]

Brazil obviously did not wish to change the nature of the intersessional process in regard to the review of science and technology, and it is probable that a number of other States Parties shared such sentiments.<sup>39</sup> As the representative of the United States observed:<sup>40</sup>

"... today's health security threats arise from at least five sources:

- The threat of acquisition or use of biological weapons by States or non-State actors;
- The risks posed by advances in biological science capabilities, which have incredible beneficial potential, but also pose risks related to accidental release or deliberate misuse;
- The emergence and spread of drug-resistant pathogens;
- The vulnerabilities created by the globalization of both travel and the food supply; and
- The emergence of new pathogens."

Clearly, different States could order the importance of these, and other threats from natural diseases, in different ways and use a variety of methods<sup>41</sup> to make their point, including opposing attempts to make the review of science and technology more efficient and effective.

At least three side events at the meeting were relevant to the session on the review of science and technology. Unfortunately, the one that was probably of most direct and immediate relevance to States Parties - as it introduced and discussed a new report requested by the government of The Netherlands from the Netherlands Royal Academy<sup>42</sup> on the assessment of dual-use research following the H5N1 influenza experiments - took place after the science and technology session and at a time when a number of other side events were taking place. So although The Netherlands was

able to mention the report in the session on the review of science and technology, there was no chance for the key points made at the side event to be fed back into the session. As it was, the Chair finished the session after only one hour and forty minutes when the discussion had been exhausted.

## 6. THE REPORT OF THE MEETING OF STATES PARTIES

In her opening remarks for the Meeting of States Parties the Chair noted<sup>43</sup> that as there were now Standing Agenda Items that ran from year to year "[T]his requires some arrangement to be able to link the reports of each year together in order to provide input into the Eighth BWC Review Conference to be held in 2016." As we have seen, Australia and six other States had suggested that in order to achieve the aim of promoting common understanding and effective action through the report of the meeting it was necessary for the report<sup>44</sup> to identify and address issues where there was something new to be said, enough agreement for this to be specific and where there was something for States Parties to do.

The revised draft elements for inclusion in the Report of the Meeting of States Parties produced by the Chair at 17.30 pm on 13 December 2013<sup>45</sup> repeated much of the material that was included in the report of the Meeting of States Parties in 2012,<sup>46</sup> but there were some new elements in this revised draft under the science and technology SAI. For example, in regard to education and awareness-raising:<sup>47</sup>

"...States Parties agreed on the value of using science responsibly as an overarching theme to enable parallel outreach efforts across inter-related scientific disciplines, as well as taking full advantage of active learning techniques, consistent with national laws and regulations."

and:

"State Parties agreed on the value of promoting education on the Convention and the dual-use nature of biotechnology, including through preparing easily accessible and understandable courses, integrating considerations of biosecurity with broader efforts on bioethics, and assessing the impact of such education."

These are surely sensible additions to the previously stated common understandings but, of course, they do not require States to take effective action to achieve such goals.

The session on the review of science and technology had begun with a presentation by Stefan Mogl as a member of the OPCW's Scientific Advisory Board Temporary Working Group on the Convergence of Chemistry and Biology. The draft report stated:<sup>48</sup>

"...States Parties recognized the value of exploring appropriate ways and means to promote greater collaboration between the CWC and the Convention to analyze potential benefits, risks and threats resulting from relevant advances in science and technology."

and that:

"States Parties agreed on the value of increasing participation of scientific and technical experts in national delegations to Meetings of Experts. States Parties also recognize the value of contributions to the Sponsorship Programme to facilitate such participation."

and thus produced new language which built upon that within the 2012 Meeting of States Parties.

In his opening statement the head of the United States delegation argued strongly for such cumulative developments of understandings in the meeting, and that:<sup>49</sup>

"...In this process, we should also strive for specificity: 'constructive ambiguity' is a popular term among diplomats, but it is much less popular with those who have to implement the decisions. So we should aim to be concrete and specific in describing our shared understandings, or they are unlikely to result in effective action."

A possible example of such a concern can be seen in regard to the central question addressed in this paper. The revised draft elements produced by the Chair at 17.30 pm on 13 December state that:<sup>50</sup>

"Recognizing the importance of thoroughly and effectively reviewing science and technology developments relevant to the Convention, and of keeping pace with rapid changes in a wide range of fields, States Parties agreed on the value of considering, in future meetings, possible ways of establishing a more systematic and comprehensive means of review."

That is certainly new language compared to the 2012 report, but what is missing is what followed in the **original** draft elements produced by the Chair at 10.00 am on 12 December. In these original draft elements the quotation above continued as follows:<sup>51</sup>

"...Possibilities could include:

- (a) Making life science technical experts routine members of delegations to Meetings of Experts, and encouraging interaction and collaboration;
- (b) Considering optimal ways that technical experts and diplomats can exchange information at BWC meetings to mutual benefit;
- (c) A board to provide science advice, similar to the Scientific Advisory Board of the CWC, or based on a different model;
- (d) An open-ended working group to consider the implications of advances in science and technology, including the convergence of chemistry and biology;
- (e) Encouraging States Parties that host national or international meetings addressing relevant science and technology developments to prepare a summary on the implications for the Convention."

Whilst neither the revised, or the original formulation required States Parties to take any action, the **original** draft appears to provide a clearer basis for the kinds of discussions suggested by Switzerland in their Working Paper for the meeting.<sup>52</sup>

## 7. A CASE IN POINT: DEALING WITH DUAL-USE EXPERIMENTS

In May 2013 Lord May, former UK Chief Scientist and a past President of the UK Royal Society, called Chinese scientists appallingly irresponsible in carrying out Gain of Function (GOF) experiments intended to demonstrate that deadly H5N1 avian influenza could be made transmissible between mammals.<sup>53</sup> Scientific and technological developments may rarely be revolutionary, but incremental advances add up and lead to significant changes in capabilities. Moreover, as Professor Matthew Meselson of Harvard University noted over a decade ago, capabilities in biological sciences cannot be kept out of a multitude of hands<sup>54</sup> as the relevant technologies become cheaper and easier to use.

Referring back to the seminal 2001 University of Maryland study, *Controlling Dangerous Pathogens: A Prototype Protective Oversight System*,<sup>55</sup> the authors of the 2013 Royal Netherlands Academy report<sup>56</sup> pointed out that the Maryland study had suggested that a tiered local, national and international oversight system would be required for dual-use research. The putative international organisation was termed an International Pathogens Research Authority in the Maryland study and the Netherlands report commented:

"...Would it be possible to do this within the context of existing institutions, for example the World Health Organisation or the Biological and Toxin Weapons Convention (BTWC)? International discord on this topic would make decision-making - let alone consensus - extremely difficult, if not impossible. For example, the BTWC has not succeeded in approving a verification regime to monitor compliance with its Convention."

Such a dismissal of the possible utility of the BTWC to deal even with the pressing problem of dual-use research is widespread. For example, in the November/December 2013 edition of *Foreign Affairs* Laurie Garrett pointed out that:<sup>57</sup>

"The Biological Weapons Convention process can serve as a multilateral basis for DURC [Dual-Use Research of Concern]-related dialogue. It offers a neutral platform accessible to nearly every government in the world. But that process is weak at present, unable to provide verification akin to that ensured by its nuclear and chemical weapons counterparts..."

On the evidence of the 2013 Meeting of States Parties, it is unlikely that such judgements will alter. It is possible to envisage small changes in the review of science and technology continuing to be made in 2014 and 2015 that could improve the process a little, for example in better designation of the side events and their linkage to the formal sessions, but no significant change appears likely before the next Review Conference in 2016.

This is regrettable, for as David Relman, co-chair of the Lemon-Relman report, noted in his editorial commentary to the recent papers on a new form of botulinum toxin, the Corson report on *Scientific Communication and National Security*, which is often said to be the basis of the policy

that scientific work should be openly available unless classified, also discussed a 'grey area' of research activities for which restrictions less than classification were appropriate. Relman argued that:<sup>58</sup>

"As more powerful techniques are used to explore the natural world and generate novel biological diversity, benefits and risks will both multiply and magnify. And the 'grey area' will expand..."

In short, he was arguing that there will be more dual-use experiments that will cause concern, and these will often be more difficult to deal with than the botulinum toxin experiments that he was commenting on because the solution there was fairly obvious - to voluntarily withhold information until counter-measures were developed.

Relman continued by stressing that these 'grey area' research activities are now much more challenging and have larger greater potential consequences than those discussed in the 1980s Carson report. Thus, as the life sciences now include so many different disciplines and enterprises spread around the world, in his view:

"...more expansive, balanced, and dispassionate discussion will be needed, and it must include difficult questions *such as whether there are experiments that should not be undertaken because of disproportionately high risk...*" [emphasis added]

The BTWC ISP meetings should surely have a role in such discussions because of the topics set for the meetings in 2014 and 2015.

It will be recalled that these topics are:<sup>59</sup> for 2014, "(c) advances in the understanding of pathogenicity, virulence, toxicology, immunology and related issues..."; and for 2015, "d) advances in production, dispersal and delivery technologies of biological agents and toxins." As for the topics for 2014, it may be asked why, over a decade after we began to discuss dual-use in regard to the life sciences, the focus is on single experiments when it may well be much more important to consider the risks posed by a series of experiments. Should we not ask, for example, where the GOF experiments being undertake in deadly influenza viruses is likely to lead?<sup>60</sup>

Concerning the topics for 2015, the UK stated, following a UK Royal Society report on *Neuroscience, conflict and security*, which argued that advances in neuroscience should be considered in the BTWC reviews of science and technology, that:<sup>61</sup>

"...Although neuroscience is not specifically mentioned in the list of topical subjects to be addressed by the new intersessional process, advances in production, dispersal and delivery technologies of biological agents and toxins is to be considered in 2015. This would be the time to direct attention to this Royal Society recommendation, and the UK calls upon States Parties to come prepared to that meeting..."

Whilst it might be argued that some progress has been made in our understanding of dual-use experiments in the fields of microbiology and immunology since the turn of the millennium, the

same cannot be said of other areas of potential concern such as neuroscience. Yet this is an area in which massive new funding<sup>62</sup> for research is being made available, and in which few practitioners have any concern about dual-use risks,<sup>63</sup> and where experience concerning dual-use microbiology may not be in this very different field.

If this analysis is even partially correct it leaves the question of why the SAI on Science and Technology, and by implication the ISP, is such a dismal failure? Some **possible** explanations are set out in Table 4. It can be argued that it would be difficult to distinguish between these hypotheses, but that probably does not matter much as the end result appears to be over-determined and this is most unlikely to change in the near future.

**Table 4:** Some possible reasons for the failure of the ISP to address scientific and technological advances

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1. Differences between capitals remain over the desirability and/or possibility of effective verification and therefore of the detection of non-compliance. In such circumstances there could be reservations about open discussion of the impact of the revolution in biotechnology.
2. Some capitals view the ISP as merely a means of keeping the BTWC on life support as it could cause problems for more important matters if the Convention fell apart. In such circumstances nothing much needs to result from the ISP apart from it continuing.
3. Some capitals think that the benefits of the biotechnology revolution so far outweigh the possible risks that they do not want any interference with the benefits from activities related to the risks arising from the ISP.
4. Some capitals think that the risks inherent in the biotechnology revolution are so great that they do not want any interference with their own preparations for dealing with the risks arising from activities generated by the ISP.
5. Some capitals have little interest in the BTWC as such, but find it a useful place to pursue their agendas against other states.
6. Most diplomats have little education or interest in science and technology assessments so they prefer to concentrate on other issues.
7. Even if diplomats were interested in science and technology assessments few scientists would be able to explain what is going on in the biotechnology revolution and to indicate the possible implications for the BTWC.
8. As the BTWC is not a major priority on the international arms control agenda it is not given enough time and resources to have a realistic chance of dealing with a complex issue like the impact of scientific and technological advances alongside its other agenda items.
9. Continued frustrating failure to make progress leads to lack of expectation of progress and thus to the setting of ever diminishing objectives.
10. Given that the BTWC is not seen as a major priority in many capitals its proceedings can always be disrupted by outside political events.
11. Any of these reasons operate to influence the behaviour of different states at different times therefore making it difficult to predict the response to initiatives intended to make progress.
12. Different combinations of these reasons dominate discussions at different ISP meetings making step-by-step advances very difficult.

In the longer term, it is to be hoped that the proposal by Switzerland<sup>64</sup> for an extended discussion of a new structure for the review of science and technology can be agreed by a number of States<sup>65</sup> and successfully presented to the Eighth Review Conference. In the meantime, we have to trust that nothing serious goes amiss in the modern life sciences before then.

## 8. TOWARDS THE 2016 BTWC EIGHTH REVIEW CONFERENCE

At the States Parties' meeting in December 2013 a paper was presented by Australia, Canada, Chile, Colombia, Czech Republic, Finland, Ghana, Lithuania, Netherlands, Nigeria, Republic of Korea and Sweden, in effect representatives from around the world. The paper was entitled *Addressing Modern Threats in the Biological Weapons Convention: A food for thought paper*.<sup>66</sup> Whilst not addressing problems in the ISP process specifically, it did set out a clear view of the problems facing the BTWC and suggested what the objective of the process should be. In summary, it stated that those countries agreed that:

"...BWC States Parties must continue to engage in constructive discussions with a goal of promoting *effective actions* on the implementation and enforcement of all aspects of the BWC..." [emphasis added]

More pointedly, the paper continued:

"...Provisions requiring particular attention include measures to promote biosafety and biosecurity, for addressing *dual-use research* and exports of concern and for ensuring that all States Parties have the capability to effectively detect and respond to disease outbreaks..." [emphasis added]

Looking forward to strengthening the Convention at the Eighth Review Conference, these States Parties argued that:

"...To this end, we recommend that States Parties seek to develop clear understandings and recommendations on such issues in the reports of the meetings of States Parties from 2013 to 2015."

In short, whilst decisions cannot be taken on issues until 2016, the reports of ISP meetings should do everything possible to facilitate such decisions at the next Review Conference.

This point on facilitating *action* was also quite clear in the letter sent to States Parties on 14 February 2014 by the Chairman of this year's meetings.<sup>67</sup> Ambassador Urs Schmid of Switzerland argued that the previous two years' work had developed a sound and practical approach and:

"One way we can build on this foundation is to start giving greater focus to the *effective action* part of our mandate. The reports of the 2012 and 2013 Meetings of States Parties contain a broad range of *common understandings*, some quite detailed. In 2014, we will

continue to discuss and promote common understandings on the three standing agenda items and the biennial topic..." [original emphases]

But, he continued:

"...as we move closer to the Eighth Review Conference in 2016, this may be a suitable point to turn more of our attention towards options for promoting effective action. *I would therefore like to request your feedback and assistance in identifying which areas may be ripe for a greater focus on action, and how such action might be achieved in practical terms, within the limits of our mandate...*" [emphasis added]

In his presentations to Regional Groups in early April<sup>68</sup> Ambassador Schmid several times reiterated his view on the importance of moving towards effective action this year. Thus there might be possibilities for the development of more action at the next Review Conference in regard to advances in science and technology. Moreover, the evolution and potential integration of responses to the key problem of dual-use at national and international levels is becoming much clearer.<sup>69</sup> However, the BTWC can always be overshadowed by political events outside of its processes and the present differences over Ukraine might well make action-orientated progress in Geneva difficult to achieve.

## 9. RECOMMENDATIONS

1. In the 2014 and 2015 meetings of the BTWC States Parties should now identify key scientific and technological issues of relevance to the Convention. These include the need to deal with dual-use experiments as well as the need for awareness raising and education of life scientists. States Parties should also define what actions can usefully be taken and reported to the 8th Review Conference in 2016 in regard to these key issues.
2. Individual States Parties should now take practical steps at national level to deal with what they consider to be key scientific and technological issues. These steps need to take place in a timeframe that allows reporting of outcomes to the 8th Review Conference.
3. International and national scientific associations should accept some responsibility for providing input to the 8th Review Conference. Their input should be reports on practical actions related to key scientific and technological developments relevant to the Convention.

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