

---

# Never Mind the Science, Here's the Convention on Biological Diversity: Viral Sovereignty in the Smallpox Destruction Debate

Michelle F Rourke\*

---

*Since the eradication of smallpox was declared in 1980, debate has ensued over what to do with the remaining stocks of the causative agent, variola virus. For more than three decades the World Health Organization has resolved to destroy the virus isolates, now maintained in high-security laboratories in the Russian Federation and the United States, and each time the deadline has been deferred. The legal facets of this debate have been largely overlooked. As genetic resources, all viruses fall within the scope of the United Nations' Convention on Biological Diversity (CBD) that provides for "the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources". This article examines the possible ownership scenarios for variola viruses and concludes that the conservation principles of the CBD and the ambiguous sovereign status of individual isolates may preclude the destruction of the world's remaining variola stocks.*

**Keywords:** *smallpox; access and benefit sharing; Convention on Biological Diversity; virus; resource sovereignty*

## INTRODUCTION

In May 1980, after a decade-long intensive vaccination program, the Thirty-Third World Health Assembly (WHA) declared the global eradication of smallpox.<sup>1</sup> The WHA recommended that all remaining stocks of variola virus, the causative agent of smallpox, be either destroyed or sent to one of four World Health Organization (WHO)-approved collections.<sup>2</sup> In 1990, the consolidated virus stocks were earmarked for destruction on 31 December 1993, but when that time came the decision was deferred.<sup>3</sup> For more than three decades, the decision to destroy the last remaining stocks of variola virus has been repeatedly delayed. Hundreds of vials of variola are still stored in two WHO-accredited repositories, one in the United States and the other in the Russian Federation (formerly part of the Union of Soviet Socialist Republics (USSR)). The ongoing debate in both the literature and under the auspices of the WHO encompasses scientific, public health, international security and even ethical considerations.<sup>4</sup> The legal facets of this debate have been largely overlooked.

---

\* Griffith Law School, Griffith University, Gold Coast, Queensland; Australian Defence Force Malaria and Infectious Disease Institute, Gallipoli Barracks, Enoggera, Queensland. The opinions expressed here are those of the author and do not reflect any views or positions of the Australian Defence Force.

Correspondence to: michelle.rourke@griffithuni.edu.au.

<sup>1</sup> Declaration of Global Eradication of Smallpox, 33<sup>rd</sup> World Health Assembly, WHA33.3 (World Health Organization, 1980).

<sup>2</sup> Recommendations of the Global Commission for the Certification of Smallpox Eradication Regarding Policy for the Post-eradication Era, 33<sup>rd</sup> World Health Assembly, WHA33.4 (World Health Organization, 1980).

<sup>3</sup> World Health Organization, "Destruction of Variola Virus: Memorandum from a WHO Meeting" (1994) 72 *Bulletin of the World Health Organization* 841, 841.

<sup>4</sup> For a summary of the recommendations made by the WHO's various advisory groups and committees on smallpox throughout the post-eradication period see A Khalakdina, A Costa and S Brianda, "Smallpox in the Post-eradication Era" (2016) 20 *Weekly Epidemiological Record* 257.



In 2007, the Sixtieth WHA requested that the Director-General of the WHO “submit to the Sixty-first World Health Assembly a report on the legal status of the variola virus strains held at the two repositories with respect to their ownership”.<sup>5</sup> A full report was never forthcoming based on “the lack of sufficient information”<sup>6</sup> and a summary report from the Ninth meeting of the WHO’s Advisory Committee on Variola Virus Research simply concluded that the original transfers of samples to the United States and Russia were made without “a clear specification of the legal basis on which virus strains were transferred and would be held by the recipient repositories”.<sup>7</sup> That is, the legal basis for member states transferring their remaining variola stocks to WHO-designated repositories was not made clear at the time,<sup>8</sup> and the legal status of those samples remains ambiguous.<sup>9</sup> The Advisory Committee’s report concluded the matter by stating “there appear to be uncertain, as well as variable, ownership scenarios for the stocks in question at the two repositories”.<sup>10</sup>

The ownership status of variola stocks has not been addressed further and the continuing debate between what have been dubbed the “retentionist” and “destructionist” camps<sup>11</sup> has been based primarily on the scientific merits and public health risks involved in retaining these viruses in their current state. This article will argue that the samples of variola viruses stored in the United States and Russian repositories are classified as genetic resources under the UN *Convention on Biological Diversity* (CBD). While these *ex situ* collections were not consolidated until the early 1980s and the CBD did not enter into force until the end of 1993, it will be argued that this widely adopted treaty simply reaffirmed the existing sovereign rights of nations over their natural resources, including any genetic resources. The article will outline the various ownership scenarios that could be applied to the remaining variola isolates, and will consider the associated access and benefit sharing (ABS) ramifications. The article concludes that these now extremely rare and potentially very valuable viruses should be retained because of the legal obligation to respect sovereignty pending the consent of the countries of origin of these genetic resources.

## SMALLPOX AND THE POST-ERADICATION ERA

Smallpox was a widespread and deadly infectious disease that has devastated human populations since the beginning of recorded history. The disease, so named because of the small spotted pustules that form over the bodies of patients, could cause blindness, disfigurement and was fatal in approximately 30% of cases.<sup>12</sup> The variola virus that causes smallpox is a species of the Orthopoxvirus genus,<sup>13</sup> a genera of enveloped double-stranded DNA viruses. Variola virus is highly contagious, spread by close contact with infected people or contaminated objects where the virions can remain stable and infectious for days.<sup>14</sup> Declared eradicated in 1980, the smallpox virus was estimated to have caused 300 million deaths in the 20th century alone.<sup>15</sup>

---

<sup>5</sup> *Smallpox Eradication: Destruction of Variola Virus Stocks*, 60<sup>th</sup> World Health Assembly, A60/9, WHA60.1 (World Health Organization, 2007).

<sup>6</sup> *Smallpox Eradication: Destruction of Variola Virus Stocks*, 61<sup>st</sup> World Health Assembly, A61/6, WHA61.1 (World Health Organization, 2008), 4.

<sup>7</sup> World Health Assembly A61/6, n 6, 4.

<sup>8</sup> World Health Assembly A61/6, n 6, 4; *Summary Records of Committees, Reports of Committees*, 61<sup>st</sup> World Health Assembly, WHA61/2008/REC/3 (World Health Organization, 2008) 28–29.

<sup>9</sup> World Health Assembly A61/6, n 6, 4.

<sup>10</sup> World Health Assembly A61/6, n 6, 4.

<sup>11</sup> J B Tucker, “Breaking the Deadlock over Destruction of the Smallpox Virus Stocks” (2011) 9 *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science* 55.

<sup>12</sup> Depending on the strain of variola, the fatality rate could be as high as 50%. F Fenner et al, *Smallpox and Its Eradication* (World Health Organization, 1988) 53.

<sup>13</sup> International Committee on Taxonomy of Viruses, *Virus Taxonomy, 2015 Release* (2015) <<http://www.ictvonline.org/virustaxonomy.asp>>.

<sup>14</sup> D A Henderson et al, “Smallpox as a Biological Weapon: Medical and Public Health Management” (1999) 281 *Journal of the American Medical Association* 2127, 3132.

<sup>15</sup> Khalakdina, Costa, and Brianda, n 4, 258.

While the issue of smallpox had been on the WHO's radar since its inception in 1948, in 1958 the Eleventh WHA initiated a concerted smallpox eradication program.<sup>16</sup> The variola virus has many traits that made it a prime candidate for targeted elimination. It infects only human hosts and there are no alternative animal reservoirs from which the virus could re-emerge. The closely related vaccinia virus, the causative agent of cowpox, can elicit an effective immune response that is protective against variola virus. The viral DNA of variola virus cannot generate mutations rapidly and the vaccine derived from vaccinia virus therefore remained effective for the duration of the elimination program. In 1965, the Eighteenth WHA reaffirmed its commitment to the ongoing vaccination and control efforts, declaring "the world-wide eradication of smallpox to be one of the major objectives of the [WHO]".<sup>17</sup>

In 1977 the last naturally occurring case of smallpox was recorded in a patient from Somalia,<sup>18</sup> and the WHO officially declared the global eradication of smallpox in 1980.<sup>19</sup> This was undoubtedly a momentous triumph of public health and has since become a model for other infectious disease eradication efforts. Polio, for instance, another highly infectious viral disease, has been the subject of a targeted eradication program since 1988.<sup>20</sup> While not as straightforward as the eradication of smallpox, the poliomyelitis eradication program has been extremely effective in reducing polio transmission, with the disease remaining endemic only in Pakistan and Afghanistan.<sup>21</sup>

Towards the end of the 1970s, as the eradication of smallpox was starting to become a reality, the WHO did not have records on how many laboratories maintained stocks of variola virus.<sup>22</sup> It was likely that many of the countries with smallpox diagnostic capabilities would be maintaining stocks of the virus as positive controls. In 1977, the Thirtieth WHA urged "governments and laboratories to continue to cooperate in preparing the international register of laboratories retaining stocks of variola virus or specimens from smallpox cases".<sup>23</sup> The WHA also recommended that laboratories either destroy their variola virus stocks, or send them to WHO-designated collaborating centres.<sup>24</sup> While many laboratories did destroy their variola viruses and a register of the remaining stocks was compiled, there was no way of confirming whether this non-compulsory survey captured accurate or complete information. After the declaration of smallpox eradication in 1980, the WHA again urged countries to either destroy their variola stocks or transfer them to one of four WHO-approved laboratories.<sup>25</sup> The approved laboratories were located in South Africa, the United Kingdom, the United States and the USSR.<sup>26</sup>

In 1983 the two high-security biocontainment laboratories in the United States and the USSR were remodelled,<sup>27</sup> ready for the final consolidation of the world's variola stocks. By 1984 the Centers for Disease Control (CDC) in Atlanta, United States and the Moscow Research Institute for Viral Preparations, USSR were the only official repositories of variola virus.<sup>28</sup> In 1994 the variola repository

---

<sup>16</sup> *Smallpox Eradication*, 11<sup>th</sup> World Health Assembly, WHA11.54 (World Health Organization, 1958).

<sup>17</sup> *Smallpox Eradication Programme*, 18<sup>th</sup> World Health Assembly, WHA18.38 (World Health Organization, 1965).

<sup>18</sup> Fenner et al, n 12, ix.

<sup>19</sup> World Health Assembly 33.3, n 1.

<sup>20</sup> *Global Eradication of Poliomyelitis by the Year 2000*, 41<sup>st</sup> World Health Assembly, WHA41.28 (World Health Organization, 1988).

<sup>21</sup> World Health Organization, *Poliomyelitis* (April 2016) <<http://www.who.int/mediacentre/factsheets/fs114/en/>>. In mid-August 2016, initial reports indicated the re-emergence of poliovirus in Nigeria. See <<http://www.promedmail.org/post/4410331>>.

<sup>22</sup> Fenner et al, n 12, 1338.

<sup>23</sup> *Smallpox Eradication*, 30<sup>th</sup> World Health Assembly, WHA30.52 (World Health Organization, 1977).

<sup>24</sup> World Health Assembly 30.52, n 23.

<sup>25</sup> World Health Assembly 33.4, n 2.

<sup>26</sup> Fenner et al, n 12, 1274. This resolution was supported by both the United States and the USSR at the time, see J M Lane and G A Poland, "Why Not Destroy the Remaining Smallpox Virus Stocks?" (2011) 29 *Vaccine* 2823.

<sup>27</sup> Fenner et al, n 12, 1275.

<sup>28</sup> Tucker, n 11, 56.

at Moscow was transferred to the State Research Center of Virology and Biotechnology (VECTOR) in Koltsovo, Novosibirsk Region in Russia, where it remains today.<sup>29</sup>

In 1986 the WHO's Committee on Orthopox Infections recommended "that remaining stocks of variola virus be destroyed".<sup>30</sup> This recommendation was confirmed by the Ad Hoc Committee on Orthopox Virus Infections in December 1990 and the date of destruction was set for 31 December 1993.<sup>31</sup> The destructionist argument was based on the fact that accidental release or re-emergence was deemed too great a risk to take,<sup>32</sup> and that cloned viral DNA was assumed to be sufficient for future research purposes.<sup>33</sup> The 1993 deadline passed and the Ad Hoc Committee again assessed the arguments for and against destruction in a meeting in September 1994, setting a new destruction deadline of 30 June 1995.<sup>34</sup> Again, the deadline passed and in 1996 the Forty-Ninth WHA recommended "that the remaining stocks of variola virus ... should be destroyed on 30 June 1999".<sup>35</sup> The destruction deadline was extended again in 1999,<sup>36</sup> 2002,<sup>37</sup> 2007,<sup>38</sup> and 2011.<sup>39</sup> In 2014 the Sixty-Seventh WHA considered the destruction of smallpox virus stocks too late in the meeting to reach a consensus and the issue was placed on the backburner once more.<sup>40</sup> A report from the WHO Advisory Committee on Variola Virus Research released in 2016 summarised the current status of the debate, indicating that ongoing research on antiviral agents would take a minimum of three years to complete, thus pushing the ultimate decision back yet again.<sup>41</sup> The report recommended inclusion of this item on the provisional agenda of the Seventy-Second WHA in 2019.<sup>42</sup> Based on the precedent set over the last three decades, it is probable that decision will continue to be deferred indefinitely.

## FROM FERVENT RESOLVE TO HESITANT RELUCTANCE: THIRTY YEARS OF THE DESTRUCTION DEBATE

This reticence is understandable when it is noted that this decision has to be made "in a scientific world decidedly different from one in which the idea of smallpox virus destruction was first proposed".<sup>43</sup> Technology has advanced and scientists are starting to appreciate just how little is known about variola

---

<sup>29</sup> Tucker, n 11, 57.

<sup>30</sup> World Health Organization, "Scientific Activities" (1986) 64 *Bulletin of the World Health Organization* 801, 802.

<sup>31</sup> World Health Organization, n 3, 841.

<sup>32</sup> It should be noted that in the definitive document on smallpox in the post-eradication era stated that "[t]he possibility of escape of variola virus from either of the two high-security laboratories that now retain it is extremely remote", Fenner et al, n 12, 1338.

<sup>33</sup> World Health Organization, n 30, 802.

<sup>34</sup> World Health Organization, n 3, 842.

<sup>35</sup> *Smallpox Eradication – Destruction of Variola Virus Stocks*, 49<sup>th</sup> World Health Assembly, WHA49.10 (World Health Organization, 1996).

<sup>36</sup> *Smallpox Eradication – Destruction of Variola Virus Stocks*, 52<sup>nd</sup> World Health Assembly, WHA52.10 (World Health Organization, 1999).

<sup>37</sup> *Smallpox Eradication – Destruction of Variola Virus Stocks*, 55<sup>th</sup> World Health Assembly, WHA55.15 (World Health Organization, 2002).

<sup>38</sup> World Health Assembly A60/9, n 5.

<sup>39</sup> *Smallpox Eradication – Destruction of Variola Virus Stocks*, 64<sup>th</sup> World Health Assembly, WHA64(11) (World Health Organization, 2011).

<sup>40</sup> B Butler, "WHO Postpones Decision on Destruction of Smallpox – Again", *Nature News Blog*, 28 May 2014 <<http://blogs.nature.com/news/2014/05/who-postpones-decision-on-destruction-of-smallpox-stocks-again.html>>.

<sup>41</sup> *Smallpox Eradication: Destruction of Variola Virus Stocks: Report by the Secretariat*, A69/23 (World Health Organization, 22 April 2016) provisional agenda item 14.3, 3.

<sup>42</sup> World Health Assembly A69/23, n 41, 4.

<sup>43</sup> R S Weinstein, "Should Remaining Stockpiles of Smallpox Virus (Variola) Be Destroyed?" (2011) 17 *Emerging Infectious Diseases* 681, 682.

virus, and how valuable these samples may be.<sup>44</sup> Since the destruction of the smallpox stocks was first tabled in the 1980s, there has been a notable shift in attitudes about global security and biodefence. In 1992, a prominent Russian scientist who had defected to the United States revealed the vast and unexpected extent of the former USSR's biological warfare research program that had a significant smallpox component.<sup>45</sup> The events of 11 September 2001 permanently altered the Defense and Homeland Security policies of the United States, and Russia has demonstrated a firm reluctance to participate in scientific collaborations with the United States since 2005,<sup>46</sup> all of which have amounted to a distrustful apprehension to destroy the remaining stocks of what could be an all-too-easily weaponised virus.<sup>47</sup>

Concerns surrounding weaponisation and the ability to generate variola virus from its genetic sequence are not unfounded.<sup>48</sup> The technology and knowledge needed to synthesise viruses is already "well-established" and it has been noted "the only two remaining ingredients now needed to create a live poxvirus from elemental chemicals are motivation and money".<sup>49</sup> Given the likelihood that undeclared variola stocks are being harboured either deliberately or accidentally, and the technological capacity to generate variola virus de novo, the destruction of the two WHO repositories of variola virus might "merely be a symbolic gesture that provides only an illusion of security".<sup>50</sup> Indeed, the concern that there might be undeclared samples of smallpox in laboratories around the world turned out to be vindicated when in July 2014 six glass vials labelled "variola" dating back to the 1950s were discovered in a US laboratory.<sup>51</sup> Regrettably, these viruses were found in a government facility belonging to the US Food and Drug Administration at the National Institutes of Health in Bethesda.<sup>52</sup> Two of the vials were found to contain virus that was still viable,<sup>53</sup> demonstrating that there is every chance that there exists undeclared stocks of variola around the globe which could be used for nefarious purposes. The variola virus has many of the characteristics that make it a desirable bioweapon.<sup>54</sup> It is durable, highly infective and a huge proportion of the world's population has not been vaccinated and has no immunity to smallpox.<sup>55</sup> This has culminated in a high level of reticence to destroy the tools that might be necessary to counter a smallpox-related bioterrorism event. The once vehement resolve to destroy the world's remaining smallpox stocks has dissolved and the likelihood of reaching a consensus on this issue is diminishing over time.

<sup>44</sup> As theoretical physicist John Archibald Wheeler famously said "as the island of our knowledge grows, so does the shore of our ignorance", quoted in J Horgan, "The New Challenges" (1992) 267 *Scientific American* 16.

<sup>45</sup> K Alibek, *Biohazard – The Chilling True Story of the Largest Covert Biological Weapons Program in the World – Told from Inside by the Man Who Ran It* (Random House, 1999).

<sup>46</sup> Tucker, n 11, 59.

<sup>47</sup> Henderson et al, n 14.

<sup>48</sup> Leonard Adleman, professor of computer science and molecular biology pointed out that smallpox was eradicated because the variola virus had only one host species, but conceptualises the computer as a new host, harbouring smallpox in the form of genetic sequence data. See L Adleman, "Resurrecting Smallpox? Easier Than You Think", *New York Times*, 15 October 2014 <<http://nyti.ms/1DdE7zN>>.

<sup>49</sup> G McFadden, "Killing a Killer: What Next for Smallpox?" (2010) 6 *PLoS Pathogens* e1000727, 3.

<sup>50</sup> McFadden, n 49, 3.

<sup>51</sup> Centers for Disease Control and Prevention, "CDC Media Statement on Newly Discovered Smallpox Specimens" (Media Statement, 8 July 2014) <<http://www.cdc.gov/media/releases/2014/s0708-nih.html>>.

<sup>52</sup> Centers for Disease Control and Prevention, n 51.

<sup>53</sup> United States House of Representatives Committee on Energy and Commerce, *Supplemental Memorandum: Committee Investigation on the 2014 Discovery of Smallpox Vials at the National Institutes of Health, Bethesda, Maryland Campus* (19 April 2016) Memorandum <<http://docs.house.gov/meetings/IF/IF02/20160420/104823/HHRG-114-IF02-20160420-SD003.pdf>>.

<sup>54</sup> L L Gooze and E C Hughes, "Smallpox" (2003) 18 *Seminars in Respiratory Infections* 196.

<sup>55</sup> Henderson et al, n 14, 3132.

## EX SITU REPOSITORIES OF GENETICALLY DIVERSE AND VIABLE VIRUS ISOLATES

The variola viruses maintained at the two repositories in the United States and Russia are not simply a homogenous collection of viruses that can be characterised by a single consensus genetic sequence. The collection at the CDC in the United States contains “451 isolates and specimens” and VECTOR in Russia maintains “120 strains”.<sup>56</sup> These samples have been collected from diverse geographical locations around the world, although the provenance of many of these samples is difficult to establish.<sup>57</sup> Each vial would contain millions, if not billions of virions, individual virus particles encoding heterogeneous genetic sequences. These genetic variations determine how the virus interacts with its host. For instance, two distinct strains of variola may differ in virulence and respond differently to antiviral drugs. Genetic sequence data usually represents the consensus genetic sequence of the strain, not the sequence of each individual virion.<sup>58</sup> Indeed, if a virus population has high levels of genetic heterogeneity, the consensus genetic sequence may not be representative of a single virion within that population.<sup>59</sup> The double-stranded DNA of the variola genome has a hairpin end, which is difficult to sequence and is therefore often omitted from sequence data. While it has been claimed that with the handful of strains that have already been sequenced there is no need for additional sequencing to occur,<sup>60</sup> it should be noted that the consensus genetic sequence data of only a few strains of variola virus captures some, but not all of the genetic information contained within the more than 500 samples currently known to be in existence.

While genetic sequence data are sufficient to study some of the characteristics of viruses, viable viruses are required to develop and test antiviral drugs and vaccines, and to develop animal models of infection. Viable virus samples are also useful when conducting research into virulence factors and minimum infective doses, and determining the correlates of host specificity, pathogenesis and immune response.<sup>61</sup> These genetically varied variola viruses stored in the two WHO-approved repositories represent ex situ repositories of genetic resources. As genetic resources, these viruses fall under the purview of the United Nations’ CBD. The application of this international treaty to the stores of variola virus results in a number of legal implications that ultimately support the retention of these potentially valuable genetic resources.

## THE CBD AND VARIOLA VIRUS ISOLATES

The CBD was finalised at the Rio Earth Summit in 1992 and entered into force on 29 December 1993.<sup>62</sup> There are 196 parties to the CBD with the notable exception of the United States,<sup>63</sup> making it one of the most widely ratified enforceable multilateral treaties. Its objectives are “the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources”.<sup>64</sup> This multilateral treaty attempted to link biological diversity financially to the conservation of that diversity and outlined the conditions for bilateral ABS for the international transfer of genetic resources.<sup>65</sup> Put simply, the CBD sets out the regulation for accessing a

---

<sup>56</sup> World Health Organization Advisory Committee on Variola Virus Research, WHO/HSE/GAR/BDP/2009.3, Report of the 11<sup>th</sup> mtg (2009) 5.

<sup>57</sup> World Health Assembly A61/6, n 6, 4.

<sup>58</sup> As the variola virus is encoded by a DNA genome, the intra-strain genetic variation is unlikely to be as diverse as has been demonstrated in some RNA virus populations. The point here is that it has not yet been quantified and the remaining samples of smallpox may not be well represented by consensus sequence data.

<sup>59</sup> Although it is unlikely that a DNA virus population of sufficient size would harbour such levels of genetic variation.

<sup>60</sup> Lane and Poland, n 26.

<sup>61</sup> I K Damon, C R Damaso and G McFadden, “Are We There Yet? The Smallpox Research Agenda Using Variola Virus” (2014) 10 *PLoS Pathogens* e1004108.

<sup>62</sup> See R Panjabi, *The Earth Summit at Rio: Politics, Economics and the Environment* (Northeastern University Press, 1997).

<sup>63</sup> See <<https://www.cbd.int/information/parties.shtml>>.

<sup>64</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 1.

<sup>65</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15.

country's biological materials and an obligation to negotiate the benefits that might flow from providing that access.

The CBD defines “[b]iological diversity” as “the variability among living organisms from all sources”,<sup>66</sup> covering both inter- and intra-species variability. It defines “genetic resources” as “genetic material of actual or potential value”,<sup>67</sup> and further defines that “[g]enetic material” as “any material of plant, animal, microbial or other origin containing functional units of heredity”.<sup>68</sup> Whether or not the drafters of the CBD intended to include human pathogenic material, it is clear that as genetic resources, viruses fall within the scope of the CBD.<sup>69</sup> The CBD defines *ex situ* conservation as “the conservation of components of biological diversity outside their natural habitats”.<sup>70</sup> Therefore, the two WHO-accredited collections of variola viruses are, in accordance with the CBD, *ex situ* collections of genetic resources. The CBD advocates a preventative and precautionary approach to the conservation of biological diversity, acknowledging the “intrinsic value of biological diversity”, including the “genetic”, “economic” and “scientific ... values of biological diversity and its components”.<sup>71</sup>

The CBD is “[d]etermined to conserve and sustainably use biological diversity for the benefit of present and future generations”.<sup>72</sup> It states “where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat”.<sup>73</sup> The corollary to this is that scientific uncertainty should not be used as a means to avoid salvaging threatened biological diversity. The CBD encourages the sustainable use of all of the world's biological resources, defining “[s]ustainable use” as “the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations”.<sup>74</sup>

By categorising viruses as genetic resources, the CBD may annul some of the ethical problems occasionally associated with the smallpox destruction debate. Much of the ethical reasoning behind retaining smallpox has centred on the argument that humans do not have the right to deliberately bring about the extinction of another living species.<sup>75</sup> This leads to the inevitable argument about whether viruses can be considered alive, but when viewed through the lens of the CBD, both of these questions are rendered irrelevant. Under the CBD, the value of these viruses are not as life forms but as genetic resources, and viruses, alive or not, are undeniably genetic resources.<sup>76</sup> The application of the CBD nullifies this aspect of the debate, classifying the virus not as a living thing but as a genetic resource with “intrinsic value”.<sup>77</sup> Therefore, the issue is not the conservation of life, which amounts to an ambiguous moral debate with no definitive answer, but the conservation of genetic resources that may have more future value to science than can presently be recognised using current technologies.

The conservation principles of the CBD clearly point to the retention of the two *ex situ* repositories of variola virus as an exercise in conservation. However, this may not be the most significant consequence

---

<sup>66</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 2.

<sup>67</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 2.

<sup>68</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 2.

<sup>69</sup> Viruses cannot be utilised as a bulk commodity and their use is therefore necessarily as genetic resources. See M F Rourke, “Viruses for Sale – All Viruses Are Subject to Access and Benefit Sharing Obligations under the Convention on Biological Diversity” (2017) 39 *European Intellectual Property Review* 79.

<sup>70</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 2.

<sup>71</sup> *Convention on Biological Diversity* [1993] ATS 32, Preamble.

<sup>72</sup> *Convention on Biological Diversity* [1993] ATS 32, Preamble.

<sup>73</sup> *Convention on Biological Diversity* [1993] ATS 32, Preamble.

<sup>74</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 2.

<sup>75</sup> Fenner et al, n 12, 1339.

<sup>76</sup> The CBD applies to all viruses as genetic resources, except where a specific instrument has been agreed. See Rourke, n 69.

<sup>77</sup> *Convention on Biological Diversity* [1993] ATS 32, Preamble.

in the smallpox destruction debate. Central to the CBD is the reaffirmation “that States have sovereign rights over their own biological resources”<sup>78</sup> and that states therefore have “the sovereign right to exploit their own resources pursuant to their own environmental policies”.<sup>79</sup> Furthermore, the CBD specifies that providers of genetic resources must be the “countries of origin of such resources” or a party that has “acquired the genetic resources in accordance with [the CBD]”.<sup>80</sup> The implication here is clear: the samples that reside within the two ex situ repositories could be considered the sovereign property of the states from which they originated.

Smallpox was an horrific scourge of humanity, a virus that killed millions of people.<sup>81</sup> It was itself an agent that had “adverse impacts on biological diversity”,<sup>82</sup> and the world was right to work together to eradicate this disease in the human population. At that time, however, the variola virus was not viewed as having a positive value to society. Today, depending on how these samples are utilised, the virus has undeniable scientific value, and even potential economic value. Alarming, its greatest value may lie in the suitability of the variola virus as a weapon of bioterrorism.<sup>83</sup> A huge proportion of the public have no exposure to the virus or its vaccine.<sup>84</sup> It can be easily aerosolised, remains stable and infective in the environment for up to two days and it has a long incubation period, meaning that there is plenty of time for people exposed initially to disperse before secondarily infecting others.<sup>85</sup> While having eradicated a disease of such human import is a proud legacy of humankind, the samples themselves are not necessarily considered to be the common heritage of humankind under international law. Instead, the CBD reaffirms that genetic resources reside in the sovereign domain of the nations from which they originated. As the two ex situ variola repositories represent collections from around the globe, the ability to determine how they are utilised, including whether they can be destroyed, may not lie with the United States or Russia as the custodians of these viruses, or even with the WHO.

If variola viruses are recognised or claimed as sovereign genetic resources<sup>86</sup> then there are a series of other CBD provisions that may apply, particularly with regard to ABS. The CBD envisaged what might be considered a quid pro quo on access to genetic resources and the reciprocal sharing of benefits that arise from their utilisation.<sup>87</sup> Therefore, access to the variola viruses from the two declared smallpox repositories may be affected. “Recognizing the sovereign rights of States over their natural resources” the CBD states that “the authority to determine access to genetic resources rests with the national governments and is subject to national legislation”.<sup>88</sup> Access to sovereign genetic resources can only be granted “by Contracting Parties that are countries of origin of such resources or by the Parties that have acquired the genetic resources in accordance with [the CBD]”.<sup>89</sup> Furthermore, that access “shall be on mutually agreed terms”<sup>90</sup> and “subject to prior informed consent of the Contracting Party providing such resources”.<sup>91</sup> Therefore, if the CBD is applied to the ex situ smallpox collections,

---

<sup>78</sup> *Convention on Biological Diversity* [1993] ATS 32, Preamble.

<sup>79</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 3.

<sup>80</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(3).

<sup>81</sup> Fenner et al, n 12.

<sup>82</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 10(b).

<sup>83</sup> See J B Tucker, “Preventing the Misuse of Biology: Lessons from the Oversight of Smallpox Virus Research” (2006) 31 *International Security* 116.

<sup>84</sup> Henderson et al, n 14.

<sup>85</sup> Henderson et al, n 14, 3132.

<sup>86</sup> In accordance with the *Convention on Biological Diversity* [1993] ATS 32, Art 3 and Art 15(1).

<sup>87</sup> The access and benefit sharing regime outlined in *Convention on Biological Diversity* [1993] ATS 32, Art 15 has been expanded upon in the Nagoya Protocol.

<sup>88</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(1).

<sup>89</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(2).

<sup>90</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(3).

<sup>91</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(4).

then the states from which those samples originated may be authorised to dictate the terms of access to those samples.

In controlling access, the originating states may be able to leverage these samples to gain a share in the benefits of their utilisation.<sup>92</sup> In accordance with the CBD there may exist a requirement to share technology related to the use of those genetic resources,<sup>93</sup> and engage in “technical and scientific cooperation with other Contracting Parties, in particular developing countries”.<sup>94</sup> This could be further complicated by the fact that genetic sequence data may also be incorporated by the provisions of the CBD as a facet of the genetic resource itself. It too may be deemed the sovereign property of the originating state, although the problems associated with genetic sequence data and ABS are still contentious.<sup>95</sup>

## PROPERTY RIGHTS OVER BIOLOGICAL RESOURCES

The social and legal notion of “property is both a dynamic and an abstract concept incapable of precise definition”.<sup>96</sup> Nevertheless, the common law understanding of ownership over “moveables” is routinely applied to transferrable natural resources.<sup>97</sup> Biological resources might be considered to reside in the public domain, or be “the subject of private property, common property, and sovereign rights”.<sup>98</sup> Public domain is essentially the absence of property rights; a resource is freely available and open for use by anyone. Private property entails exclusive rights conferred upon a single legal entity regarding the access and use of an object. Similarly, common property entails exclusive rights but those rights are held by a group in common. International resources under this classification are often termed “the common heritage of humankind”, recognising ownership in common, as opposed to a lack of ownership altogether. Sovereign rights over biological resources are an extension of national sovereignty and can be viewed in two ways: “[a]t the international level, sovereignty implies that there is no authority superior to that of the state and that all states are juridically equal ... At the domestic level, the state is the repository of sovereign rights and their assertion is akin to a form of private property rights”.<sup>99</sup> These notions of ownership and sovereignty become important when considering the current legal status of the smallpox viruses held in the two *ex situ* repositories. The issue of resource sovereignty, in particular, is a key concept contained within the CBD and so requires further examination.

## RESOURCE SOVEREIGNTY AS AN EXTENSION OF STATE SOVEREIGNTY

As an international organisation the United Nations “is based on the principle of the sovereign equality of all its Members”.<sup>100</sup> Essentially, state sovereignty is the autonomy of each nation-state to exercise authority within its own territorial borders and all other states are to respect “the territorial integrity or political independence of any state”.<sup>101</sup> It is this notion of the equality of all sovereign states, no matter their geographical size, economic might or military prowess that governs modern interactions between states. The concept of permanent sovereignty over a nation’s own natural resources is an extension of

---

<sup>92</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(6).

<sup>93</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 16.

<sup>94</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 17(2).

<sup>95</sup> See C Lawson and M Rourke, “Open Access DNA, RNA and Amino Acid Sequences: The Consequences and Solutions for the International Regulation of Access and Benefit Sharing” (2016) 24 JLM 96.

<sup>96</sup> D Grinlinton, “Evolution, Adaption, and Invention: Property Rights in Natural Resources in a Changing World” in D Grinlinton and P Taylor (eds), *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (Martinus Nijhoff, 2011) 281.

<sup>97</sup> For a discussion on property rights as they apply to biological resources see P Cullet, “Property Rights Regimes over Biological Resources” (2001) 19 *Environment and Planning* 651.

<sup>98</sup> Cullet, n 97, 652.

<sup>99</sup> Cullet, n 97, 652.

<sup>100</sup> *Charter of the United Nations* Art 2(1).

<sup>101</sup> *Charter of the United Nations* Art 2(4).

state sovereignty but can also be “seen as flowing from the principle of self-determination of peoples”.<sup>102</sup> Permanent sovereignty over natural resources “legally protects the right of the states to unlimited control, free exploitation and disposal of natural resources in their territories”.<sup>103</sup> The principle of resource sovereignty developed during the postwar, postcolonial era,<sup>104</sup> and prior to this, natural resources were generally deemed to be the “common heritage of humankind”, that is, belonging to all in common. This shift away from the “common heritage of humankind” has often been attributed to the CBD itself. Some assert that “[p]rior to the CBD, all genetic resources were considered to be the ‘common heritage of [hu]mankind’”.<sup>105</sup> While there has been an undeniable shift in the way natural resources (including genetic resources) are treated under international law, there was never a clear-cut or abrupt change and the concepts remain contested.<sup>106</sup> Nevertheless, the CBD was undeniably the first legally binding international treaty to contain the concept of resource sovereignty.

The CBD “[r]eaffirm[s] that States have sovereign rights over their own biological resources”,<sup>107</sup> “in accordance with the *Charter of the United Nations* and the principles of international law”,<sup>108</sup> indicating that resource sovereignty did precede the CBD. This means that states have “the sovereign right to exploit their own resources pursuant to their own environmental policies” but this comes with the corresponding obligation “to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”.<sup>109</sup> In “[r]ecognizing the sovereign rights of States over their natural resources” the CBD endows states with “the authority to determine access to genetic resources” which “is subject to national legislation”.<sup>110</sup> So, at the domestic level, the state does exercise “a form of private property rights” over their sovereign resources.<sup>111</sup> “It is the very essence of state sovereignty over [genetic resources] that states can freely dispose upon such resources for their own uses and to provide them to third parties upon terms and conditions they may deem appropriate”.<sup>112</sup> But those terms and conditions, according to the CBD, should “facilitate access” and cannot be unreasonably restrictive.<sup>113</sup> Consequently, it must be stressed that the notion of resource sovereignty as encapsulated by the CBD does not create exclusive ownership rights, “but rather acts as a tool to manage resource exchange”.<sup>114</sup> In this sense, resource sovereignty can be conceptualised as a “tethering device” that “seeks to direct the ways that materials move and acquire value in transnational research and commodity networks”.<sup>115</sup>

---

<sup>102</sup> P T Stoll, “ABS, Justice, Pools and the Nagoya Protocol” in E C Kamau and G Winter (eds), *Common Pools of Genetic Resources – Equity and Innovation in International Biodiversity Law* (Routledge, 2013) 306.

<sup>103</sup> P Gümplová, “Restraining Permanent Sovereignty over Natural Resources” (2014) 53 *Enrahonar. Quaderns de Filosofia* 93, 96.

<sup>104</sup> Gümplová, n 103.

<sup>105</sup> M Ruiz, “The Museum as a Vehicle for Considered Judgements on Access and Benefit Sharing” in J H Vogel (ed), *The Museum of Bioprospecting, Intellectual Property, and the Public Domain* (Anthem Press, 2011) 33. A similar position is taken in N Barizah, “State Obligations on Virus Sample Sharing: From Common Heritage of Mankind to State’s Sovereign Right” (2013) 20 *Jurnal Media Hukum* 191.

<sup>106</sup> See, eg, J Frakes, “The Common Heritage of Mankind Principle and Deep Seabed, Outer Space, and Antarctica: Will Developed and Developing Nations Reach a Compromise” (2003) 21 *Wisconsin International Law Journal* 409.

<sup>107</sup> *Convention on Biological Diversity* [1993] ATS 32, Preamble.

<sup>108</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 3.

<sup>109</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 3.

<sup>110</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(1).

<sup>111</sup> Cullet, n 97, 652.

<sup>112</sup> P T Stoll, “Access to GRs and Benefit Sharing – Underlying Concepts and the Idea of Justice” in E C Kamau and G Winter (eds), *Genetic Resources, Traditional Knowledge and the Law* (Earthscan, 2009) 5.

<sup>113</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15.2.

<sup>114</sup> A Hinterberger and N Porter, “Genomic and Viral Sovereignty: Tethering the Materials of Global Biomedicine” (2015) 27 *Public Culture* 361, 366.

<sup>115</sup> Hinterberger and Porter, n 114, 371.

## SO WHO OWNS SMALLPOX?

In 1983 the WHO directed the transfer of the world's remaining variola stocks to the two repositories in the United States and the USSR. It is now clear that "transfers effected at the time were not necessarily performed with a clear specification of the legal basis on which virus strains were transferred and would be held by the recipient repositories".<sup>116</sup> Despite the legal uncertainty surrounding the ownership status of the variola viruses, the two laboratories have "agreed to hold and handle all stocks of the virus as a form of cooperation with the WHO".<sup>117</sup> It can be argued that the proprietary status of those samples depends on the basis on which those samples were transferred. While some WHO member states transferred their variola stocks on the understanding that their ownership rights were thus terminated, others conducted the transfer on the understanding that they retained ownership.<sup>118</sup> Therefore, "there appear to be uncertain, as well as variable, ownership scenarios for the stocks in question at the two repositories".<sup>119</sup> As yet, these "ownership scenarios" have not been clarified or analysed.

As previously discussed, there are a finite number of ways to classify property rights over genetic resources. As the transfers of variola virus were negotiated and decided under the aegis of the WHO, the role of the state in mediating these arrangements was implicit. At that time member states themselves were exercising their sovereign authority to engage in such negotiations and control the transfer of these resources in the international arena. Therefore, public domain and private property rights are not appropriate classifications of these resources at the time when member states were contemplating and negotiating the transfer of their variola samples. Accordingly, prior to 1983, these viruses were being dealt with on the international stage either as common heritage resources or as sovereign resources. Therefore, only a handful of ownership scenarios can be applied to delineate their contemporary (post-transfer) legal status.

The first scenario holds that the viruses were considered to be the common heritage of humankind prior to their transfer, and remain the common heritage of humankind today. Alternatively, the viruses were considered the sovereign property of the originator and the samples themselves, as well as the ownership rights to those samples were simultaneously transferred to the repositories in 1983. The samples would now, therefore, be considered the sovereign property of the recipient states, the United States and Russia. The final scenario posits that while the sovereign samples were physically transferred, ownership rights were not concurrently transferred and the samples remain the sovereign property of the originating country. If this final scenario holds, then the United States and Russia are acting solely as the caretakers of other nations' sovereign resources and do not have any proprietary rights over those samples. There are numerous arguments to support each of these three present-day ownership scenarios, all of which are complicated by the fact that property rights have not been applied consistently to genetic resources in the past and that the CBD, the primary international instrument for dealing with access to genetic resources, did not enter into effect until a decade after these *ex situ* variola collections were assembled.

This raises issues about the temporal scope of the CBD itself. The *Vienna Convention on the Law of Treaties* states that "[u]nless a different intention appears from the treaty or is otherwise established, its provisions do not bind a party in relation to any act or fact which took place or any situation which ceased to exist before the date of entry into force of the treaty with respect to that party".<sup>120</sup> The CBD does not make any provisions for retroactivity. Indeed, it has been argued that "[t]he effect of Article 15(3) of the [CBD] is to exclude from the remit of its provisions on access and benefit-sharing those genetic resources acquired before the entr[y] into force of the [CBD]".<sup>121</sup> This was the position of the

<sup>116</sup> World Health Assembly A61/6, n 6, 4.

<sup>117</sup> World Health Assembly, WHA61/2008/REC/3, n 8, 29.

<sup>118</sup> World Health Assembly A61/6, n 6, 4.

<sup>119</sup> World Health Assembly A61/6, n 6, 4.

<sup>120</sup> *Vienna Convention on the Law of Treaties* [1974] ATS 2, Art 28.

<sup>121</sup> *Conference of the Parties to the Convention on Biological Diversity, Access to Genetic Resources, Note by the Executive Secretary*, UNEP/CBD/COP/3/20 (United Nations Environmental Program, 1996) 11.

Conference of the Parties (COP) to the CBD in 1995.<sup>122</sup> If ex situ collections are excluded from the remit of the CBD, then its provisions “do not govern access to the vast collections of genetic resources obtained before the [CBD] entered into force”.<sup>123</sup> Any ex situ collections of genetic resources obtained prior to 29 December 1993, including the ex situ collections of variola virus consolidated in 1983, are outside the scope of the CBD and are therefore considered the common heritage of humankind.

There is some precedent here in relation to ex situ collections of plant genetic resources. In 1983 the Food and Agriculture Organization (FAO) of the United Nations adopted the *International Undertaking on Plant Genetic Resources for Food and Agriculture* (International Undertaking) which was “based on the universally accepted principle that plant genetic resources are a heritage of [hu]mankind and consequently should be available without restriction”.<sup>124</sup> The use of the “heritage of [hu]mankind” principle indicated that permanent sovereignty over natural resources was not viewed as an entrenched legal norm by the early 1980s, despite its frequent citation in international fora throughout the 1970s.<sup>125</sup>

The treatment of the ex situ germplasm collections of the Consultative Group on International Agricultural Research (CGIAR) after the entry into force of the CBD supports the notion that some genetic resources may still be considered the common heritage of humankind. In 1994 the FAO and CGIAR entered into a series of agreements that placed these pre-existing ex situ germplasm collections “under the auspices of FAO and held by the centres in trusteeship for the international community”.<sup>126</sup> Notably, the International Undertaking was later renegotiated to accord with the CBD, resulting in the adoption of *International Treaty on Plant Genetic Resources for Food and Agriculture* in 2001.<sup>127</sup> This binding treaty recognised “the sovereign rights of States over their own plant genetic resources for food and agriculture”<sup>128</sup> and established a Multilateral System to facilitate ABS for a negotiated selection of plant genetic resources including the CGIAR ex situ collections.<sup>129</sup> Importantly, here the treaty dealt with the CGIAR ex situ collections separately, continuing to classify them as common heritage and therefore recognising their uncertain legal status and the unresolved sovereignty claims.<sup>130</sup>

If this common heritage argument is applied to the variola collections, then the United States and Russia are simply the custodians of the viruses and have no ownership rights over them. Like the CGIAR collections, the variola viruses are held “in trusteeship for the international community” under the auspices of the WHO. This argument, however, presupposes that the viruses were not already considered the sovereign property of the nation-states that transferred them to the ex situ variola repositories. As discussed, “the CBD did not bring a real paradigm shift away from common heritage of humankind to state sovereignty over biological resources as often stated by CBD-critical voices, but reaffirms existing international legal principles”.<sup>131</sup> As a principle of international law, resource sovereignty predates the

---

<sup>122</sup> *Conference of the Parties to the Convention on Biological Diversity, Access to Genetic Resources and Benefit-Sharing: Legislation, Administrative and Policy Information*, UNEP/CBD/COP/2/13 (United Nations Environmental Program, 1995) 16. It should be noted, however, “the CBD does not expressly confer on the COP the authority to interpret the treaty”, F M Abbot, “An International Legal Framework for the Sharing of Pathogens: Issues and Challenges” (2010) *International Centre for Trade and Sustainable Development* 12.

<sup>123</sup> *Conference of the Parties to the Convention on Biological Diversity*, n 122, 17.

<sup>124</sup> Food and Agriculture Organization, *International Undertaking on Plant Genetic Resources for Food and Agriculture*, Resolution 8/83, 22<sup>nd</sup> FAO Conference (1983) Art 1.

<sup>125</sup> See nn 132-137 and associated text.

<sup>126</sup> *Conference of the Parties to the Convention on Biological Diversity*, n 122, 13.

<sup>127</sup> Food and Agriculture Organization, *Adoption of the International Treaty on Plant Genetic Resources for Food and Agriculture and Interim Arrangements for its Implementation*, Resolution 3/2001, 31<sup>st</sup> FAO Conference (2001).

<sup>128</sup> *International Treaty on Plant Genetic Resources for Food and Agriculture* [2002] ATNIF 14, Art 10.1.

<sup>129</sup> *International Treaty on Plant Genetic Resources for Food and Agriculture* [2002] ATNIF 14, Art 11.5; see also C Lawson, *Regulating Genetic Resources – Access and Benefit Sharing in International Law* (Edward Elgar, 2012) 181–186.

<sup>130</sup> See *International Treaty on Plant Genetic Resources for Food and Agriculture* [2002] ATNIF 14, Art 15.

<sup>131</sup> P Munyi et al, “Capacity Development in a Changing World – Three Years of the ABS Capacity Development Initiative for Africa: Achievements and Perspectives” in E C Kamau and G Winter (eds), *Genetic Resources, Traditional Knowledge and the Law: Solutions for Access & Benefit Sharing* (Earthscan, 2009) 383.

CBD and it has been argued that the CBD was simply reaffirming an existing fact of law. There is much to support this claim. For instance, the UN General Assembly explicitly documented the “inalienable right” of “permanent sovereignty over natural wealth and resources” in 1962.<sup>132</sup> This was “reaffirm[ed]” by resolutions in 1966,<sup>133</sup> again in 1972,<sup>134</sup> and “strongly reaffirm[ed]” in 1973.<sup>135</sup> The *Charter of Economic Rights and Duties of States* (1974) affirmed that “[e]very State has and shall freely exercise full permanent sovereignty, including possession, use and disposal, over all its wealth, natural resources and economic activities”,<sup>136</sup> and the *Declaration on the Establishment of a New International Economic Order* (1974) upholds the “[f]ull permanent sovereignty of every State over its natural resources and all economic activities”.<sup>137</sup> While these resolutions and declarations are non-binding, they illustrate the fact that resource sovereignty was firmly established in international fora prior to the WHO’s move to consolidate the variola stocks in 1983. There is no way to verify whether the WHO member states contributing viruses to the ex situ collections were doing so as guardians of resources they considered to be the common heritage of humankind, or as the sovereign owners of those resources. Therefore, in assessing the various ownership scenarios that may exist over the ex situ variola collections as they exist today, resource sovereignty must also be considered.

Recognising resource sovereignty as “a form of private property rights”<sup>138</sup> over variola isolates prior to their transfer in 1983 poses a dilemma when determining who holds those sovereign rights now. While the samples themselves were physically transferred to the United States and the USSR, there is next to no documentary evidence to verify whether ownership rights were concurrently transferred.<sup>139</sup> If they were, then the United States and Russia as the recipient states may now hold sovereign title over those materials. If, however, the states from which those samples originated transferred them on the understanding that they would retain ownership rights, then the United States and Russia are simply the caretakers of the originating nations’ sovereign resources.

## ABS UNDER THE CBD

Determining who owns the variola isolates is not simply an eristic exercise; there are tangible benefits to be gained by any party that can demonstrate legal ownership of these resources. In accordance with the CBD, access to genetic resources is determined by the providing party and benefit-sharing obligations are triggered by the utilisation of those resources. The temporal scope of the CBD has already been discussed, and it is clear that the provisions of the CBD cannot be applied to the consolidation of variola isolates that occurred in 1983. It has been argued that “Contracting Parties from which genetic resources were obtained before the [CBD]’s entry into force have no legal claim under the [CBD] to invoke the benefit-sharing provisions of articles 15, 16 and 19 for the past and future use of these genetic resources”.<sup>140</sup> It could also be argued that while “simple ongoing possession of pre-CBD material is not covered (due to ‘true retroactivity’), new forms of utilization are covered, requiring users to seek PIC [prior informed consent] and MAT [mutually agreed terms] from providers”.<sup>141</sup> That is, the negotiation of ABS obligations associated with uses of the variola viruses after 29 December 1993 may not represent

<sup>132</sup> *Permanent Sovereignty over Natural Resources*, UN GA Res 1803 (xvii) (14 December 1962).

<sup>133</sup> *Permanent Sovereignty over Natural Resources*, UN GA Res 2158 (xxi) (22 November 1966).

<sup>134</sup> *Permanent Sovereignty over Natural Resources of Developing Countries*, UN GA Res 3016 (xxvii) (18 December 1972).

<sup>135</sup> *Permanent Sovereignty over Natural Resources*, UN GA Res 3171 (xviii) (17 December 1973).

<sup>136</sup> *Charter of Economic Rights and Duties of States*, UN GA Res 3281 (xxix) (12 December 1974) Art 2.1.

<sup>137</sup> *Declaration on the Establishment of a New International Economic Order*, UN GA Res 3201 (s-vi) (1 May 1974).

<sup>138</sup> Cullet, n 97, 652.

<sup>139</sup> World Health Assembly A61/6, n 6, 4.

<sup>140</sup> L Glowka et al, “A Guide to the Convention on Biological Diversity” (International Union for Conservation of Nature and Natural Resources – Environmental Policy & Law Paper No 40, 1994) 79.

<sup>141</sup> C Godt, “Networks of Ex Situ Collections of Genetic Resources” in E C Kamau and G Winter (eds), *Common Pools of Genetic Resources – Equity and Innovation in International Biodiversity Law* (Routledge, 2013) 262.

the retroactive application of the CBD as “the obligation results from new facts”.<sup>142</sup> Importantly, in exercising their sovereignty “[n]ational ABS legislation can stipulate that [ABS] should apply to new applications utilizing genetic resources” no matter when they were acquired.<sup>143</sup>

The CBD specifies that in “[r]ecognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation”.<sup>144</sup> Therefore, as the recognised sovereign owner of a particular variola sample, a state is empowered under the CBD to determine the terms of access to those samples.<sup>145</sup> “[Access] may be understood to refer to the entirety of entitlements, rights and legal authorization necessary for all the different activities involved in the search for, collection of, exportation and use of [genetic resources] as ruled upon by the respective state on the basis of its sovereign rights”.<sup>146</sup> A sovereign state can therefore ensure that any benefits derived from the use of their genetic resources accrue to them. It should be noted that the CBD instructs providers to “endeavour to create conditions to facilitate access to genetic resources” and not impose wanton restrictions.<sup>147</sup>

The CBD creates the conditions for the bilateral transfer between provider and user states. As there are currently no special provisions for variola viruses, access to these samples should therefore be based on this bilateral ABS model with benefits accruing to whichever state can demonstrate sovereign title. If the current holders of the viruses, that is, the United States and Russia, can demonstrate sovereign title over these resources, then the benefits associated with their use will accrue to them. If individual contributing nations can demonstrate that they maintained ownership rights over the viruses that originated from within their borders, then the benefits will accrue to those individual states. However, if the global community were to come to a consensus that the smallpox viruses should be considered the common heritage of humankind, then a multilateral ABS system like that already in place for the CGIAR collections discussed above, may be more appropriate. The ex situ repositories would then be classified simply as being held in trust for the international community and the United States and Russia could not directly dictate terms of access. It should be remembered that “the question of what constitutes a benefit for all [hu]mankind seems to rest... largely on the particular interests of each nation as it does on each of their forms of government”.<sup>148</sup> Now that it has been established that individual states may be able to directly accrue benefits through bilateral transfers of variola viruses, a unanimous agreement to classify them common heritage seems improbable.

## CONSEQUENCES OF THE UNITED STATES NOT BEING PARTY TO THE CBD

A further complication related to the application of the CBD to the ex situ holdings of variola virus is that one of the major caretaker parties, the United States, has signed but not yet ratified the CBD.<sup>149</sup> This fact does not in any way diminish the “inalienable sovereignty of States over their natural wealth and resources”.<sup>150</sup> In imploring the United States to ratify the CBD, one author contends that “absolutely no loss of legal or natural resource sovereignty is even possible under the express terms of the [CBD]”.<sup>151</sup>

---

<sup>142</sup> T Greiber et al, “An Explanatory Guide to the Nagoya Protocol on Access and Benefit-Sharing” (International Union for Conservation of Nature and Natural Resources, IUCN Environmental Policy and Law Paper No 83, 2012) 73.

<sup>143</sup> *The Convention on Biological Diversity and the Nagoya Protocol: Intellectual Property Implications – A Handbook on the Interface between Global Access and Benefit Sharing Rules and Intellectual Property*, UNCTAD/DIAE/PCB/2014/3 (United Nations Conference on Trade and Development, 2014) 18.

<sup>144</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(1).

<sup>145</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(3).

<sup>146</sup> Stoll, n 102, 5.

<sup>147</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(2).

<sup>148</sup> Frakes, n 106, 433.

<sup>149</sup> See <https://www.cbd.int/information/parties.shtml>.

<sup>150</sup> *Permanent Sovereignty over Natural Resources*, n 132.

<sup>151</sup> W J Snape, “Joining the Convention on Biological Diversity: A Legal and Scientific Overview of Why the United States Must Wake Up” (2010) 10 *Sustainable Development Law & Policy* 6, 6.

This implies that the sovereign status of natural resources is fixed, irrespective of which nations ratify or do not ratify the CBD. What is affected by the United States not being party to the CBD is the specific “tethering” of natural resources to a requirement for benefit sharing.<sup>152</sup> But this is only applicable to the United States as a provider of genetic resources, not as a user. At any rate, the previous discussion established that the United States as an *ex situ* repository of other countries’ sovereign viruses may simply be an intermediary to the otherwise bilateral provider-to-user transaction.

In establishing the terms of bilateral ABS arrangements, the CBD defers to domestic law, specifying that “[e]ach Contracting Party shall take legislative, administrative or policy measures, as appropriate ... with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources”.<sup>153</sup> Therefore, as a provider of genetic resources, the United States is not obliged to enter into ABS arrangements as it is not party to the CBD. Conversely, as a user of genetic resources, the United States must abide by the domestic laws of the provider country. That is, if the United States wishes to utilise any variola viruses that have been claimed as sovereign by a state party to the CBD, then they should abide by the domestic legislation of the provider nation. As the variola viruses were consolidated under the auspices of the WHO in the 1980s, prior to the introduction of the CBD, the United States cannot be accused of infringing any sovereign rights for acquiring or maintaining these *ex situ* stocks. However, if the United States wishes to utilise those same samples for research or development, they must use variola samples that are known to have been isolated from within US territories. Alternatively, if any isolates are subject to claims of sovereignty by Parties to the CBD (ie every other state apart from the Holy See),<sup>154</sup> they are obliged to follow that nation’s domestic ABS regulations.

## UTILISATION OF SMALLPOX AND THE AUTHORITY TO DESTROY

In accordance with objectives of the CBD, the triggering event for benefit-sharing obligations is the “utilisation”, and not simply the acquisition of genetic resources.<sup>155</sup> Despite being the triggering event for ABS obligations, the CBD does not define the term “utilisation”. The CBD directs Contracting Parties to “take legislative, administrative or policy measures ... with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources”.<sup>156</sup> That is, the “results of research” into genetic resources are considered to be benefits existing separately from those “benefits arising from the commercial and other utilization”.<sup>157</sup> However, the CBD does not indicate what uses of genetic resources are covered by the term “commercial and other utilisation”. In an attempt to clarify what constitutes “utilisation” within the meaning of the CBD, an ABS Working Group compiled a detailed, but non-exhaustive list of possible uses of genetic resources.<sup>158</sup> Consequently, there remains some ambiguity about what is and is not considered to be “utilisation” so individual Contracting Parties are at liberty to determine what uses of their sovereign genetic resources are included in their domestic ABS policies. This is important in the argument surrounding the destruction of the smallpox viruses, as the act of destruction might itself be considered a form of utilisation. Indeed, it is the last possible form of utilisation for such samples. Accordingly, Russia and the United States (even as a non-party to the CBD) do not have the authority to destroy any samples that have been claimed as sovereign by other states. As caretakers of the world’s

---

<sup>152</sup> Hinterberger and Porter, n 114.

<sup>153</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(7).

<sup>154</sup> See <https://www.cbd.int/information/parties.shtml>.

<sup>155</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 1.

<sup>156</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(7).

<sup>157</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 15(7).

<sup>158</sup> Ad Hoc Open-Ended Working Group on Access and Benefit-Sharing, *Report of The Meeting of the Group of Legal and Technical Experts on Concepts, Terms, Working Definitions and Sectoral Approaches*, UNEP/CBD/WG-ABS/7/2 (United Nations Environment Program, 2008) 7–8.

variola viruses, they can only legally destroy those samples which are known to have originated in their own sovereign territories or that they now hold as the legal owners.

Neither the United States nor Russia have the authority to destroy or otherwise utilise any samples that are the subject of sovereign claims by other states. This may even be the case if the samples, held in trust with the United States and Russia, are earmarked for destruction by the WHO which can pass such resolutions on the basis of a two-third majority. Unless every state with a sovereign claim over any of the variola stocks has also agreed to this resolution, destruction may not be considered lawful under the CBD. It may also be the case that Russia may not have to obtain permission from the United States, as a non-party to the CBD, to utilise any viruses in their possession that may have originated from the United States. The reverse is not true for any Russian isolates that might be held in trust in the United States. Apart from this specific scenario, the non-ratification of the CBD by the United States does not materially impact upon the application of the CBD to the *ex situ* smallpox collections.

While the WHO continues to seek a consensus on the smallpox destruction debate, this is less and less likely to occur the longer the decision is deferred. The scientific ramifications of destruction are clear: it “is an irrevocable action that should occur only when the global community has eliminated the threat of smallpox once and for all”.<sup>159</sup> Given the impossibility of proving that a particular threat does *not* exist, the opinion tendered by many scientists appears to support indefinite retention of the smallpox stocks.<sup>160</sup> The application of the CBD to this situation also supports retention. Natural resources, particularly those that relate to global public health, may be considered the common concern of humankind but they are not necessarily still considered common heritage of humankind.<sup>161</sup> As mentioned, the control of the world’s natural resources, including genetic resources have been placed in the domestic sphere by the principles of international law, and reaffirmed by the CBD. By passing a resolution to destroy the smallpox viruses, the WHO may encroach on the sovereign rights of those nations that have a stake in those resources and do not explicitly agree to such an action. At any rate, any such ruling would be considered a recommendation, and not a binding obligation on the two caretaker nations, the United States and Russia.

In an op-ed published by the *New York Times* in 2011, then US Secretary of Health and Human Services indicated that the United States may not comply with the WHO even if a recommendation was passed to destroy all remaining stocks of variola virus.<sup>162</sup> This argument is not based on the fact that the United States does not want to encroach on the sovereignty of other nation-states, rather it appears to be driven primarily by the mutual distrust between the United States and Russia. In 2008, Russia informed the WHO that “200 working stocks of non-viable or duplicate material were destroyed” in the previous year,<sup>163</sup> but this was not conducted under supervision, and there is no way to verify that this destruction occurred as claimed. The suspicion arose that the 200 samples might simply have been “taken off the books”.<sup>164</sup> Again, with the impossibility of proving that this was not the case, as well as the inability to verify that there are not undeclared stocks of smallpox being stored accidentally or surreptitiously around the globe, the reluctance to destroy those samples is growing. This ultimately puts the WHO in a difficult position. If the WHO does manage to pass a resolution to have the smallpox viruses destroyed, the unbinding nature of that resolution and the fact that it is known that the United States (and probably Russia) will not comply, risks undermining the authority of the WHO. International organisations are

---

<sup>159</sup> K Sebelius, “Why We Still Need Smallpox”, *The New York Times*, 25 April 2011 <<http://www.nytimes.com/2011/04/26/opinion/26iht-edsebelius26.html>>.

<sup>160</sup> This is not true of all scientists. Some famous scientists and physicians like Frank Fenner and Donald Ainslie (“D.A.”) Henderson, both of whom were involved in the program for the global eradication of smallpox, fell squarely in the smallpox “destructionist” camp.

<sup>161</sup> See Lawson, n 129, 14–16.

<sup>162</sup> Sebelius, n 159.

<sup>163</sup> *Advisory Committee on Variola Virus Research*, Report of the 10<sup>th</sup> mtg (World Health Organization, 19–20 November 2008) 1.

<sup>164</sup> J B Tucker, “The Smallpox Destruction Debate: Could a Grand Bargain Settle the Issue?” (2009) 39 *Arms Control Today* <[https://www.armscontrol.org/act/2009\\_03/tucker](https://www.armscontrol.org/act/2009_03/tucker)>.

only as strong as “their capacity to induce deference in other actors”,<sup>165</sup> and the WHO could be weakened by a resolution to destroy the remaining variola stocks.

## A WAY FORWARD? THE NAGOYA PROTOCOL AND SPECIFIC ABS INSTRUMENTS

In 2010 the COP to the CBD adopted the *Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization* (Nagoya Protocol).<sup>166</sup> The Nagoya Protocol entered into force on 12 October 2014,<sup>167</sup> and has 103 Parties at the time of writing.<sup>168</sup> The Nagoya Protocol acts to clarify the nature and scope of the ABS scheme outlined by the CBD.<sup>169</sup> For example, the CBD cursorily recognised the importance of traditional knowledge of indigenous and local communities, linking the utilisation of such knowledge to ABS obligations.<sup>170</sup> However, it provided no indication as to how this was to occur. The Nagoya Protocol bolsters this provision by stipulating that each contracting party take measures to ensure “that traditional knowledge associated with genetic resources that is held by indigenous and local communities is accessed with the prior and informed consent or approval and involvement of these indigenous and local communities and that mutually agreed terms have been established”.<sup>171</sup> While it is not immediately clear how the issue of traditional knowledge might affect access and utilisation of viruses, “it must not be forgotten that traditional knowledge, innovations, and practices on animals, plants, insects, or ecosystems can provide interesting leads to and an initial screen for isolating particular properties of genetic resources found in nature”.<sup>172</sup> Therefore, it is possible that this provision on traditional knowledge might shape future sovereignty and ABS negotiations regarding viruses, including the variola stocks.

The Nagoya Protocol also clarifies the conditions regarding access to genetic resources as laid out in the CBD. Together the CBD and Nagoya Protocol form the default international ABS framework for genetic resources. Importantly, the Nagoya Protocol makes provision for specialised ABS instruments, applicable to subsets of genetic resources.<sup>173</sup> The CBD and Nagoya Protocol do not apply “[w]here a specialized international access and benefit-sharing instrument applies”.<sup>174</sup> Accordingly, there exists scope under the default CBD and Nagoya Protocol ABS framework to negotiate a specialised agreement that applies to the two ex situ collections of variola virus. Indeed, there is already a specialised ABS agreement that applies specifically to a subset of viruses. The *Pandemic Influenza Preparedness Framework* was negotiated under the auspices of the WHO in 2011 and exists as a specialised international ABS framework applying only to the narrow subset of influenza viruses that are designated to have human pandemic potential.<sup>175</sup> This demonstrates that there is an ability to circumvent the default application of the CBD’s ABS regime to variola viruses. Until such time as the global community can come to such an agreement about the ABS provisions that should (or should not) apply specifically to the ex situ collections of variola viruses, then the CBD continues to apply as the default framework. But even if a specific agreement is concluded and in so doing the sovereign status of the variola viruses is clarified, the Nagoya Protocol indicates that specialised agreements can only be entered into if they

<sup>165</sup> J Benton-Heath, “Global Emergency Power in the Age of Ebola” (2016) 57 *Harvard International Law Journal* 1, 5.

<sup>166</sup> *Conference of the Parties to the Convention on Biological Diversity*, UNEP/CBD/COP/10/27, Report of the 10<sup>th</sup> mtg (United Nations Environment Program, 2010) Decision X/1, Annex 1, [103] (Nagoya Protocol).

<sup>167</sup> *Conference of the Parties to the Convention on Biological Diversity*, Report of the 12<sup>th</sup> mtg, UNEP/CBD/COP/12/29 (United Nations Environment Program, 2014) [101].

<sup>168</sup> See <<https://www.cbd.int/abs/nagoya-protocol/signatories>>.

<sup>169</sup> Greiber et al, n 142, 3.

<sup>170</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 8(j).

<sup>171</sup> Nagoya Protocol, n 166, Art 7, 94.

<sup>172</sup> Greiber et al, n 142, 10.

<sup>173</sup> Nagoya Protocol, n 166, Art 4(2), 92.

<sup>174</sup> Nagoya Protocol, n 166, Art 4(4), 92.

<sup>175</sup> Sixtieth World Health Assembly, *Pandemic Influenza Preparedness: Sharing of Influenza Viruses and Access to Vaccines and Other Benefits* (Pandemic Influenza Preparedness Framework), WHA60.28 (World Health Organization, 2007).

“are supportive of and do not run counter to the objectives of the [CBD] and [the Nagoya Protocol].”<sup>176</sup> Therefore, any specialised agreement pertaining to the smallpox viruses must be in keeping with the sovereignty and conservation principles of the CBD. In short, there is simply no legal basis for evading the principles of the default ABS regime created by the CBD.<sup>177</sup>

## CONCLUSION

As genetic resources, variola viruses are subject to regulation under the CBD since its entry into force on 29 December 1993. It could well be argued that the variola viruses in the two ex situ repositories are the common heritage of humankind and should be dealt with under a multilateral ABS system, not the bilateral system outlined by the CBD. However, “the common heritage principle only stands if all nations choose to abide by it”<sup>178</sup> and it will take just one claim of resource sovereignty by any one state to erode the notion that these viruses belong to all in common. There is great incentive for individual states to claim resource sovereignty in order to realise the value of these resources by regulating access and accruing any associated benefits. This notion of sovereign rights over natural resources predates the CBD and for variola stocks where provenance can be established, the states from which they originated may have scope to claim them as sovereign biological materials. As such, the US and Russian ex situ repositories would simply be holding those samples as caretakers, and the sovereign states from which they originated would be authorised to dictate the terms of access and utilisation. As it stands, the ownership status of these viruses is ambiguous and there exists a legal obligation to respect the sovereignty of those countries that may have a legitimate claim to them.

The world’s variola stocks were consolidated in the 1980s and those transfers, therefore, lie outside of the scope of the CBD. States cannot retroactively apply the CBD to the transfers of viruses that occurred in the 1980s, and accordingly, there is no scope to demand a quid pro quo for those transfers. However, the CBD can be argued to apply to pre-existing ex situ collection of genetic materials from 29 December 1993 onwards. Therefore, any utilisation of sovereign variola viruses after that date may need to comply with the ABS provisions of the CBD and could attract benefit-sharing obligations. In accordance with the CBD, destruction of these stocks may be considered a form of utilisation and sovereign samples cannot be destroyed without the explicit consent of the state from which they originated.

Furthermore, for those countries that have ratified the CBD, the principles of biodiversity conservation are applicable to all genetic resources effective from 29 December 1993. The variola samples held at the two ex situ repositories are a collection of genetically diverse samples and in accordance with the biodiversity conservation principles of the CBD, cannot be wantonly destroyed, particularly as they represent the last of their type.<sup>179</sup> Of course, it is easy to engage in reductio ad absurdum arguments when applying the conservation principles of the CBD to smallpox viruses. For instance, the CBD specifically cites a preference for in situ conservation where possible,<sup>180</sup> which in the case of a human pathogen is plainly irrational. There is no suggestion here that we should return variola virus to its native environment.<sup>181</sup> In the current situation, in situ conservation is intolerable but ex situ conservation is

---

<sup>176</sup> Nagoya Protocol, n 166, Art 4(2), 92.

<sup>177</sup> The only genetic resources that have been declared explicitly to lie outside of the scope of the CBD are human genetic resources. See *Conference of the Parties to the Convention on Biological Diversity*, n 122, 18. It should be noted, however, that while the CBD’s Conference of the Parties can and does act to clarify points of contention about the CBD, it does not have the authority to enforce certain interpretations of it. Accordingly, states themselves remain the arbiters of what resources they consider to lie within the scope of their sovereign rights.

<sup>178</sup> Frakes, n 106, 416.

<sup>179</sup> While concerns exist over undeclared variola samples, there is also a small risk that natural reservoirs of the highly stable variola virus may persist in mummified human remains. See S Reardon, “Smallpox Watch: Frozen Mummies and Envelopes of Scabs Could Contain Remnants of One of History’s Most Prolific Killers” (2014) 509 *Nature* 22.

<sup>180</sup> *Convention on Biological Diversity* [1993] ATS 32, Art 8.

<sup>181</sup> US radio personality David Boze, however, does recommend the addition of smallpox on the endangered species list, but suggests refraining from reintroduction of said endangered species into the wild. See D Boze, “Save the Smallpox!”, *The American Spectator*, 7 June 2011 <[http://spectator.org/37477\\_save-smallpox/](http://spectator.org/37477_save-smallpox/)>.

almost mandated. While somewhat less ridiculous, the argument for the repatriation of sovereign variola viruses to their originating states is probably out of the realms of possibility, given the logistical risks involved and the fervent resolve of most countries to see such risks limited.

The CBD is, without doubt, an imperfect biodiversity conservation and ABS framework. Its deference to domestic law has created a patchwork of policies that are not necessarily conducive to the efficient and effective sharing of biological resources for either commercial purposes or scientific research. Moreover, the CBD has been criticised for creating fallacious and unsustainable economic links between sovereign genetic resources to the conservation of those same resources.<sup>182</sup> While this is generally thought to represent a market failure (cheap and virtually infinite genetic resources cannot be expected to fund expensive conservation interventions), the scales are more balanced in the situation with smallpox as variola isolates are rare and access is limited. The intrinsic value of these viruses have to scientific research may pale in comparison to their potential economic value, making them desirable subjects of sovereignty claims for states hoping to leverage such an opportunity.

Up until this point, the sovereign status of variola viruses and the legal facets of this argument have been largely ignored but they must now be considered as similar situations are likely to arise in the very near future. In June 2011, the United Nations declared the eradication of the cattle plague virus, rinderpest, isolates of which now reside in high-security laboratories.<sup>183</sup> The fight against poliomyelitis is drawing to a close and laboratories around the world have already started consolidating and destroying their isolates of poliovirus.<sup>184</sup> Genetic sequence data cannot tell us all there is to know about how viral populations behave and what we destroy we can never get back. A specialised instrument permitted under the Nagoya Protocol could acknowledge that even in cases where the country of origin can be definitively identified, it may be inappropriate to apply the principle resource sovereignty to viruses and other pathogens. Any ABS terms might be better administered using a multilateral system rather than allowing individual states to govern bilateral ABS transactions in accordance with their domestic policies. These issues are going to arise time and time again and in the absence of a specialised instrument for dealing with such situations, we will be stuck with the CBD by default.

The application of the CBD does not provide any definitive answers to the debate on the destruction of smallpox, but it does provide a different and useful angle from which to approach a three-decade-long debate. Of course, the CBD was not designed with the smallpox destruction scenario in mind. The treaty concluded at the Rio Earth Summit in 1992 was an attempt at safeguarding intrinsically valuable genetic resources from humankind's short-sighted exploitation and ultimate destruction of that value. With this in mind, it is hard to envisage a situation where the application of this treaty might be more apt. As time passes, the global community's resolve to destroy the remaining caches of variola viruses is diminishing. The horrific realities of the disease are fading from our collective consciousness and the desire to witness a decisive end to the history of smallpox is giving way to growing scientific and biosecurity concerns. The CBD, which applies by default to all viruses as genetic resources, adds further weight to the argument for retaining the existing variola repositories.

---

<sup>182</sup> See J H Vogel, *Genes for Sale – Privatization as a Conservation Policy* (OUP, 1994).

<sup>183</sup> United Nations News Centre, *UN Declares Deadly Cattle Plague Eradicated after Global Campaign* (28 June 2011) <<http://www.un.org/apps/news/story.asp?NewsID=38868#.V8UtJZh9600>>.

<sup>184</sup> *WHO Global Action Plan to Minimize Poliovirus Facility-associated Risk after Type-specific Eradication of Wild Polioviruses and Sequential Cessation of Oral Polio Vaccine Use (GAPIII)*, WHO/POLIO/15.05 (World Health Organization, 2015) 5.