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OST Art. IX, Improvements: Cultural and Natural Heritage Elements

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The Symposium topic is ‘Nonbiological Contamination and Other Issues arising from OST Art. IX’. To paraphrase selectively for the purpose of this paper: under OST Art. IX states are to conduct their activities in outer space with due regard to the corresponding interests of all other States. They are to avoid ‘potentially harmful interference’ with the activities of others and the ‘harmful’ contamination of the Moon and other celestial bodies. Article IX also speaks of rights and duties to consult. What might hide under such language? We might ask what are the ‘corresponding interests’? What is the effect of the adjective harmful modifying ‘contamination’ and ‘interference’?

I am not going to wallow in such matters, fun as it can be to dance on fine distinctions and potential reinterpretations and extensions of language.¹ My title indicates the thrust. There are cultural and natural heritage aspects of space that should be protected by international agreement, and an international process established for the purpose. Article IX is not enough. We already protect certain interests on earth. Before we go much further in the exploration and use of outer space we should agree something similar for out there. The concept of the international public trust commends itself.²

There is an imperative to protect. I note with interest that in 2009 the Department of Parks and Recreation of the Resources Agency of the State of California recorded in its protected list artefacts within a 60 metre square area at Tranquillity Base on the basis of their historic importance and their having been manufactured in California.³ I also note that in 2007 the Chairman of UN COPUOS wrote that the protection or conservation of designated areas of the Moon and other solar system bodies should be of interest for COPUOS, but he left that for informal arrangements to be worked out with the IAA and COSPAR.⁴ I do not know what has happened thereafter.

Lawyers rarely invent. Instead they reach for something known which can be adapted or modified. There are adaptable terrestrial analogues to the system that I would like to see for space.

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¹ What follows draws on F. Lyall and P.B. Larsen, *Space Law A Treatise* (Farnham, UK,; Burlington VT, US, 2009); F. Lyall, ‘Exploring Celestial Bodies: Useful Aspects of the Moon Agreement, 1979’, IAC-08-E3.4.3; and the IAA Cosmic Study, Protecting the Environment of Celestial Bodies (PECB), M. Hoffman, ed., (IAA forthcoming).

² Cf. V.P. Nanda and W.K. Ris, Jr., ‘The Public Trust Doctrine: A Viable Approach to International Environmental Protection’, ((1976) 5 *Eco. L.Q.* 291.

³ Office of Historic Preservation, California State Parks; Objects Associated with Apollo 11: http://ohp.parks.ca.gov/?page_id=24479 and related Powerpoint presentation. Cf. BBC: <http://news.bbc.co.uk/1/hi/8488783.stm>; Reuters: <http://www.reuters.com/article/idUSTRE60T09G20100130>.

⁴ Cf. ‘Future role and activities of the Committee on the Peaceful Uses of Outer Space: Working paper submitted by the Chairman’ 10 May 2007, A/AC.105/L. 268, sec. F, paras 33-5, on ‘Protection/conservation of designated areas of the Moon and other bodies of the solar system’; http://www.unoosa.org/pdf/limited/l/AC105_L268E.pdf.

I should say that I am aware that notion of 'sovereignty' can generate opposition to an international body playing such a role, but that has no application in space.⁵

1. Terrestrial analogues

There are four main analogues in global terrestrial international law, three owing their birth to UNESCO.⁶

1.1. *Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972*

The obvious terrestrial analogue is the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage,⁷ itself the result of a long history. Cultural and historical heritage dates back to the days of the Grand Tour in Europe, though usually that then meant taking objects home to protect them as part of one's own collection, and as a result 'culture heritage' is now a drum for nationalists to bang.⁸ Protection of immoveable 'Nature' came with the invention of national parks.⁹ Suffice it to say that nowadays many countries protect and foster their heritage, both cultural and natural. through planning requirements, permissions and tax and other privileges. Internationally the creation of the International Union for the Conservation of Nature (IUCN) in 1948 established natural heritage as a matter of international concern.¹⁰ The 1972 Paris Convention brings together the cultural and natural aspects of the world heritage.

⁵ Cf. M. Machado, 'Mounting Opposition to Biosphere Reserves and World Heritage Sites in the United States Sparked by Claims of Interference with National Sovereignty' (1997) 9 *YB Colo. J. Int. Env. L. & Pol.* 120; E.J. Godwin, 'The World Heritage Convention, the Environment, and Compliance' 20 *Colo. J. Int'l Env. L. & Pol.* 157; G. Nicholson, 'The Common Heritage of Mankind and Mining: An Analysis of the Law as to the High Seas, Outer Space, the Antarctic and World Heritage' (2002) 6 *N.Z. J. Env. L.* 177.

⁶ I omit regional agreements such as the Convention for the Protection of the Architectural Heritage of Europe, 1985, 1988 UKTS 46, Cm. 439, the European Convention on the Protection of the Archaeological Heritage, 1992, 2002 UKTS 29, Cm. 5555, and the European Landscape Convention, 2000, 2006 UK Misc. No. 4, Cm. 6794. Their tenor shows also the impulse to protect heritage.

⁷ Convention Concerning the Protection of the World Cultural and Natural Heritage, Paris, 1972, in force 17 December 1975, 1037 UNTS 152, 1985 UKTS 2, Cmnd. 9524; 1984 Misc. 6, Cmnd. 9171; 27 UST 37, TIAS 8226; (1972) 11 ILM 1358. F. Francioni, 'Beyond State Sovereignty: The Protection of Cultural Heritage as a Shared Interest of Humanity' (204) 25 *Mich. J. Int. L.* 1209; and his 'Thirty Years On: Is the World Heritage Convention Ready for the 21st Century', (2002) 12 *Ital. YB Int. L.* 13.

⁸ Cf. the Greek claim to the 'Elgin Marbles' from the Acropolis that are now in the British Museum. The Romans took 'heritage' from Greece, Venice from Constantinople, the British from Italy, Napoleon from Venice and Egypt, and Europeans generally from the Middle East.

⁹ When I taught Environmental Law the national park movement was one topic. We began with the 1872 creation of the Yellowstone National Park (An Act to set apart a certain Tract of Land lying near the Head-Waters of the Yellowstone River as a Public Park, March 1, 1872, 42nd Cong. Sess. II, c. 24, 17 Stat. (1783-1873), 32-30) and went on to the Scottish born John Muir (1838-1914) and the National Parks Act of 1890 establishing the Yosemite and the Sequoia National Park (An act to set apart a certain tract of land in the State of California as a public park, 25 September 1890, 51st Cong. Sess. I, c. 926; 26 Stat. 478 (1887-1891), 478). Thereafter we turned to UK law, rather ignoring developments elsewhere. F. Lyall, 'Recreation, Landownership and the Countryside' 1970 *Jur. Rev.* 203. Countries such as Sweden began creating National Parks much earlier than the UK.

¹⁰ The International Union for the Conservation of Nature (IUCN), <http://www.iucn.org/>.

Paragraph three of the Preamble to the Convention, states ‘that deterioration or disappearance of any item of the cultural or natural heritage constitutes a harmful impoverishment of the heritage of all the nations of the world’. Paragraph seven holds ‘that parts of the cultural or natural heritage are of outstanding interest and therefore need to be preserved as part of the world heritage of mankind as a whole’. Article 1 considers ‘cultural heritage’ basically to comprise works of man, although natural elements may be involved. These are things of outstanding universal value from the point of view of history, art or science. Specific mention is made of historic sites. Article 2 considers ‘natural heritage’ to be natural features, including areas of outstanding universal value from the point of view of science, conservation or natural beauty. Thereafter the Convention provides for states to scrutinise their territory and inventory appropriate cultural items and natural heritage sites (Arts. 4-7 and 11). The Convention then arranges for the administration of the world system including the creation of a ‘World Heritage List’ (Art. 11.2).

1.2 Convention on the Protection of the Underwater Cultural Heritage, 2001

The Convention on the Protection of the Underwater Cultural Heritage of 2001 was also elaborated by UNESCO.¹¹ Adopted by a majority vote (87-4-15) it entered into force on 2 January 2009 and as of November 2010 has only thirty-six parties, so its strength may be uncertain. Even so its ideas are interesting for the purposes of this paper. It deals with international waters.

Subordinate to the UN Convention on the Law of the Sea (Art. 3) the Convention seeks the protection of ‘all traces of human existence’ that have been under water, periodically or continuously for at least a hundred years (Arts. 2.1 and 1.1). That includes sites and structures, wrecks and cargo (including aeroplanes) (but not pipelines or cables) (Art. 1.1.). A duty is laid on parties to preserve through the use of their national laws (Arts. 2 and 5) including their laws of salvage and of finds (Art. 4). Different levels of requirement apply to the different elements of the sea, from the territorial sea out to the Area. The Convention has a Secretariat (Art. 24) and Meetings of Parties (Art. 23).

Under the Rules annexed to the Convention the protection of underwater cultural heritage through its preservation *in situ* is the first option to be considered (Rule 1). The commercial exploitation of finds is fundamentally incompatible with the Convention, and they cannot be traded, sold, bought or bartered as commercial goods (Rule 2). Other Rules provide for recording and reporting, for public information and access, for documentation and other matters. Only qualified underwater archaeologists with relevant competence are to act (Rules 22). Conservation is to be undertaken and sites managed (Rules 24-5). Such provisions are not without interest with respect to space.

1.3 UNESCO Convention for the Safeguarding of the Intangible Heritage, 2003

The Convention for the Safeguarding of the Intangible Heritage is another product of UNESCO.¹² It entered into force on 20 April 2006, but has only a few parties. Nonetheless it seems active. Intangible heritage comprises practices, representations, expression knowledge and skills, together with their physical appurtenances that communities recognise as part of their cultural heritage. This includes oral traditions, performing arts, social practices, knowledge and practices concerning

¹¹ UNESCO: Convention on the Protection of the Underwater Cultural Heritage’, (2002) 41 ILM 40, with Introductory Note by K.R. LaMotte at 37.

¹² Convention for the Safeguarding of the Intangible Heritage: <http://www.unesco.org/culture/ich/index.php?lg=en&pg=00022> . I. Stamatoudi, ‘The Protection of Intangible Property by Means of the UNESCO Convention on the Safeguarding of Intangible Heritage and Intellectual Property Law’, (2004) 57 *Rev. Hell. de Dr. Int.* 149; P. Totcharova, ‘The 2003 UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage’, (2009) 62 *Rev. Hell. de Dr. Int.* 609.

nature and the universe, and traditional craftsmanship (Art. 2). Its interest for this paper resides in its mechanisms. It has a General Assembly of its parties (Art. 4), which elects an eighteen member 'Intergovernmental Committee' which will increase to twenty-four when there are fifty parties (Art. 5). The Committee has a variety of functions, including decisions as to the acceptance of a proposed 'intangible heritage' for consideration, and its inclusion on a list (Arts. 16-18). It can also assist in their preservation. Parties are bound to take national measures to protect intangible heritage within their jurisdiction which they have inventoried themselves and which have been listed by the Committee.

1.4. *The Antarctic system*

The fourth terrestrial analogue is the system now operating for Antarctica.¹³ Antarctica was set aside for scientific purposes under the Treaty of 1959.¹⁴ In 1988 a supplementary Convention on the Regulation of Antarctic Mineral Resource Activities was drafted as part of the Antarctic Treaty system, but has never come into force and is not likely to do so.¹⁵ Instead at Madrid in 1991 a 'Protocol on Environmental Protection to the Antarctic Treaty' was agreed as an alternative.¹⁶ Coming into force in 1998 its Art. 7 prohibits any activity in relation to mineral resources other than scientific research. The Protocol was augmented by an Annex V, adopted in Bonn later in 1991, which came into force for all the members of the Antarctic Treaty on 24 May 2002.¹⁷ Annex V provides mechanisms for the setting up and licensing of Antarctic Specially Protected Areas (ASPAs) (Art. 3) and Antarctic Specially Managed Areas (ASMA) (Art. 5), for their designation procedures (Art. 6) and the approval of their Management Plans (Art. 6). In the Areas both historic and natural features may be identified and qualify for special protection. In particular Annex V Art. 8 makes particular provision for historic sites and monuments within either type of Area and for their being listed on a register of Historic Sites and Monuments. It is also competent to identify historic and other sites outwith an Area,¹⁸ and that that had already been done prior to these arrangements.¹⁹ While obviously the Protocol's prohibition of any activity in relation to minerals other than for scientific purposes may run counter to the OST and certainly contradicts the MA, it and the Annex V material as to the designation and protection of sites should be noted. The procedures for designation step carefully round the question of territorial sovereignty.

2. Heritage in Space

¹³ See P. Sterns and L. Tennen, 'International Regime of Antarctica as a Model for Planetary Protection', PECEB, *supra* n. 1, 68-74.

¹⁴ The Antarctic Treaty, Washington, DC, 1959: 402 UNTS 71; 1961 UKTS 97, Cmnd 1535; 12 UST 794, TIAS 4780; (1980) 19 ILM 860.

¹⁵ Convention on the Regulation of Antarctic Mineral Resource Activities, Wellington, NZ, 1988: 1989 UK Misc. No. 6, Cm. 634; (1988) 27 ILM 859.

¹⁶ Protocol on Environmental Protection to the Antarctic Treaty, Madrid, 1991: 1999 UKTS 6, Cm. 4256; (1991) 30 ILM 1455.

¹⁷ Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, Bonn, 1991: 2006 UKTS 15, Cm. 8655.

¹⁸ In 1964 the parties to the Antarctic Treaty called for the identification and protection of special sites of both historic and scientific interest. Various bases both abandoned and current have been identified under these procedures. See 'Guidelines for handling of pre-1958 historic remains whose existence or present location is not known', at link via http://www.ats.aq/e/ep_protected.htm.

¹⁹ See Recommendation ATCM I-IX of the first Consultative Meeting of the Antarctic Treaty Parties, at (1961-1962) 166 BFSP 243 or http://www.ats.aq/devAS/info_measures_listitem.aspx?lang=e&id=10.

The notion of ‘heritage’ is inchoate, has been abused, and causes some to break out in a rash. With that caveat, and with due acknowledgement of the Outer Space Treaty and the Moon Agreement, applying the motivations and concepts of the UNESCO Conventions and the Antarctic system to outer space, I come up with the following - and I would be glad to hear of additions, or objections.

2.1 *Historic sites and artefacts*

The Google Earth Moon and Mars displays signpost many sites of landings, human and rover, as well as crash sites. Some of these are of historic interest and therefore should be protected. When California acted last year to include various artefacts at Tranquillity Base on its list of historic materials, the ‘no sovereignty’ provision of OST Art. II was taken into account. The area itself was not designated as a protected site. However, those behind that move would like to see the site designated by UNESCO under the 1972 Convention.²⁰ But the Convention is applicable only to the territories of its parties, so the 1972 UNESCO Convention cannot be used as presently drafted.²¹ We need some method to cope with such matters. (See below: 3. Administration). In any event it makes no sense to protect artefacts without protecting the site of their location.²²

2.2. *Natural sites*

While I appreciate the aspiration of the Google Lunar X Prize to stimulate private and commercial entrepreneurial activity, it is ill-advised. Some debated whether this is a measure suitable to encourage scientific activity but it seems to have succeeded in that aim. I am concerned that the lunar surface might be unduly affected.²³ Further, experiments or investigations based on the crashing of probes to produce dust such as the Cabeus crater LCROSS effort and the Japanese Kayuga should be subject to international control and agreement.²⁴ While the ‘contamination’ provisions of the OST and MA may have some application, procedures should be extended clearly to deal with such situations. It is not enough simply to notify that you are going to do it (OST Art. IX). Further, attention should be given to the possibility of the creation of park areas within which such activity is controlled, or even banned.²⁵ MA Art. 7.3 would make possible such a development.

2.3. *Scientific sites*

The setting aside of sites of special scientific interest is contemplated in MA Art. 7.3. This speaks of ‘international scientific preserves’ placed under ‘special protective arrangements’. Some areas of the Moon should certainly be specifically protected for scientific purposes. This should include the

²⁰ See materials, *supra* n. 1.

²¹ Art. 3: ‘It is for each State Party to this Convention to identify and delineate the different properties *situated on its territory* mentioned in Articles 1 and 2 above.’ (italics added).

²² Cf. the UNESCO Underwater Cultural Heritage Convention and its annexed Rules, *supra* n. 11.

²³ The Google Lunar X Prize: <http://www.googlelunarxprize.org/>

²⁴ On 9 October 2009 the US crashed a Centaur rocket into the Cabeus crater and observed the resultant plume by the Lunar Reconnaissance Orbiter. Water and silver were detected; http://www.nasa.gov/home/hqnews/2010/oct/HQ_10-271_LCROSS_LRO.html; ((2010) *Science*, 22 Oct. 2010, 434; A. Colaprete et al., ‘Detection of Water in the LCROSS Ejecta Plume’, (2010) 330 *Science*, 463)). (Cf. the Lunar Prospector, 31 July 1999). On 10 June 2009 Japan crashed the Kayuga (Selene) satellite to terminate its mission. Cf. the Ranger series of probes in the 1960s.

²⁵ C.S. Cockell and G. Horneck, ‘Planetary parks – formulating a wilderness policy for planetary bodies’ (2006) 22 *Space Policy* 256-61; G. Horneck and C.S. Cockell, ‘Planetary Parks - Suggestions for a Target Planetary Protection Approach; PECB, *supra* n. 1, 45-9.

setting up of radio 'quiet zones' for radio-astronomy purposes, perhaps on the lunar far-side.²⁶ Again there may be areas of lunar geology that should be protected, albeit that they may contain minerals that may come to be of commercial interest. It is better to do this earlier rather than later. The problems of Antarctica should be remembered. The attempt to regulate the exploitation of minerals has been abandoned,²⁷ *pro tempore*, but as the ice-fields retreat on the Graham Land Peninsula there is growing pressure to allow commercial activity in Antarctica. The protective designation of scientific and other sites on the Moon and elsewhere in space should be carried out well before commercial entities are in a position to intervene.

In a different perspective, why should the notion of 'site' be restricted to physicalities? The designation of Lagrange points should also be considered. They have scientific importance.²⁸ These also might be designated and thereafter their protection for scientific use be assured.²⁹

2.4. Contamination

It may be that OST Art. IX is sufficient to deal with the contamination of celestial bodies, but even so I wonder whether further more precise regulation is not required. The pollution of the steppes of Kazakhstan caused that state for a while to suspend the use by Russia of the Baikonour launch site.³⁰ What of radio-active contamination? Nuclear reactors or radio-isotopic generators may well be used to power installations and vehicles used on the moon or elsewhere and there may be the problem of crashed probes. MA Art. 7.2 requires the UN Secretary General to be informed of the placement and purpose of any nuclear materials on the moon. Should there not be a duty to clean up contamination from such materials?³¹

The potentially contaminative effects of a lunar or other base needs to be further considered.³² Ideally a base would be fully secured from environmental interaction with its surrounding area, but it has to be said that the state of the present environment round various Antarctic bases including the US Amundsen-Scott Base at the South Pole is not reassuring.³³ The second sentence of OST Art. IX speaks of the avoidance of 'harmful contamination' of the moon and celestial bodies. MA Art. 7.1 makes this more precise, requiring parties to take measures 'to prevent the disruption of the existing balance of 'the environment of the moon or other celestial body, 'whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise', and to inform the UN Secretary General of measures adopted for the purpose (MA Art. 7.1). But this language leaves

²⁶ F.G. von der Dunk, 'Space for celestial symphonies? Towards the establishment of international radio quiet zones' (2001) 17 *Space Policy* 265-74. C. Maccone, 'Lunar Farside Radio Lab' (2005) 56 *Acta Astronautica* 629-39.

²⁷ See *supra*, at n. 15.

²⁸ See Lyall and Larsen, *supra* n. 1, 247-8.

²⁹ Lagrange Point 1 is presently in use by the Solar and Heliospheric Observatory (SOHO) in halo orbit at L1, the Advanced Composition Explorer (ACE) a Lissajous orbit, and NASA's WIND satellite. All these are important.

³⁰ M. Hošková, 'The 1994 Baikonour Agreements in Operation' (1999) 42 *Proc. IISL* 263-72.

³¹ See also *infra*, Sec. 2.5. 'Debris'.

³² Moon bases, manned and unmanned, may be established (OST Art, IV para 2 and XII; MA Art. 9.1). They are to occupy a minimal area and be located so that free access by others to the area is not impeded (MA Arts. 9. 1 and 2). No property title to the area occupied is created by such activities (OST Art. II; MA Art. 11.3).

³³ M.S. Race and R.O. Randolph, 'The Need for Operating Guidelines and a Decision Making Framework Applicable to the Discovery of Non-Intelligent Extraterrestrial Life' (2002) 50 *Adv. Space Res.* 1583-91. Cf. the Wikipedia entry for the 'Great Pacific Garbage Patch', a huge area of marine debris in the North Pacific gyre. In A.C. Clarke, 'Before Eden', *Tales of Ten Worlds* (1962), life on Venus disappears, poisoned by garbage from an Earth expedition.

open the question of precisely when contamination becomes harmful.³⁴ Under such circumstances, the precautionary principle should be applied, and any error should be on the side of undue rigour and prevention rather than of risk.³⁵

2.5. Debris

OST Art. VIII means that identifiable objects remain the property of their owners, the state of registry retaining jurisdiction and control. However, although the Article goes on to provide for the return of found objects, that is as far as things go. There is nothing to stop objects being simply left.³⁶ Thus I note the plaque beside the replica of the Viking I Mars Lander in the Smithsonian Museum affirms US property right that has been transferred to the Museum. I also note that rights in and to the Russian Lunokhod-1 lunar rover have been sold.³⁷ But we should not make the littering of the Moon or other celestial bodies too easy or indeed lawful. A duty to clean up debris, and to remove un-needed or defunct equipment should be created or invented and imposed.³⁸

3. Administration

How might we set up the necessary machinery and structures? The procedures of both the main UNESCO Heritage Convention and the Antarctic Treaty system provide styles. The procedures of the Intangible Heritage Convention are similar to that of the main UNESCO Convention so they are not here repeated.³⁹ The UNESCO Underwater Heritage Convention is not so useful for this purpose, as it restricts itself as to reporting procedures and not establishing a recognised 'list'.

The 1972 UNESCO Convention relies on states to identify appropriate heritage within their territories and to recommend them to an Intergovernmental Committee for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value, known for short as the 'World Heritage Committee'. This, currently with a membership of twenty-one, is elected by the UNESCO General Conference, and members hold office on a rotating basis. The states so elected nominate as their representatives persons qualified in the field of cultural or natural heritage,⁴⁰ and representatives of the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), the International Council of Monuments and Sites (ICOMOS) the International Union for Conservation of Nature and Natural Resources (IUCN) act as advisors.

³⁴ Contamination was a matter which COPUOS was seized of, but preferred to refer to the non-binding recommendations of COSPAR (*supra* n. 4.).

³⁵ P.B. Larsen, 'Application of the Precautionary Principle to the Moon' (2006) 71 *J. Air Law & Comm.* 295-306; L.D. Roberts, 'Ensuring the Best of All Possible Worlds: Environmental Regulation of the Solar System' (1997) 6 *N.Y.U. Env. L. J.* 126-60 at 158-60.

³⁶ I almost wrote 'abandoned' but that would be incorrect as a matter of law.

³⁷ See <http://www.nasm.si.edu/exhibitions/GAL100/viking.html>. The Russian Lunokhod-1 lunar rover on the Moon were sold at Sotheby's in 1993 on the basis that it was 'resting on the surface of the Moon', the consignor undertaking no obligation to deliver possession. Only the current title rights of the owner were sold, without assurance as to the claims of others, including possible salvors. See P.D. Nesgos, UN COPUOS Symposium on Commercial Activities in Space, March 1994 (1994) 37 *Proc. IISL* 305-14 at 305-6; Sotheby's Auction Catalogue 'Russian Space History', December 1993. Cf. D.H.R. Spennemann, 'The Ethics of Treading on Neil Armstrong's Footprints' (2004) 20 *Space Policy* 279-90.

³⁸ Cf. the duty to remove abandoned or disused installations under Art. 5.5 of the Geneva Convention on the Continental Shelf, 1958 (499 UNTS 311) albeit that this was weakened by the parallel provision in Art. 60.3 of UNCLOS 1982 (1833 UNTS 3; (1994) 33 ILM 1309). See also Lyall and Larsen, *supra* n. 1, 191-2.

³⁹ For them see *supra* following n. 11.

⁴⁰ See Arts. 8-10 of the 1972 UNESCO World Heritage Convention, *supra* n. 7.

Recommendations by states require to be backed both with argument and with proof that the recommending state has included the item in its own protective procedures and in appropriate cases has established a management programme for a site it recommends. Recommendations accepted by the World Heritage Committee are included in the World Heritage List.

The Antarctica procedures are similar.⁴¹ As indicated above, for Antarctica there may be Specially Protected Areas and Specially Managed Areas with Management Plans.⁴² In addition and outwith such Areas items, properties and locations of interest may also be identified. The procedure is for states party to the Antarctic Treaty to identify and recommend such Areas or items to a Committee for Environmental Protection established under Art. 11 of the Environmental Protocol.⁴³ This Committee considers recommendations and forwards its views to the Antarctic Treaty Consultative Meeting, which may agree to the Area or item being added to the approved list of Historic Sites and Monuments.⁴⁴ Normally an approval takes effect ninety days after the Consultative Meeting. However, - and this is where the Antarctic arrangements step round the matter of 'sovereignty' - it is possible for a Consultative Party to notify the Treaty's Depository (the US) within that time period, that it wishes the ninety day period to be extended or that it is unable to approve the measure. In short, the parties to the Antarctic Treaty have a veto on the setting up of Areas, and on inclusions on the list of Antarctic Historic Sites and Monuments.

The Moon Agreement deserves some consideration here. It does recognise that some process to secure some areas of celestial bodies should be specially protected. Of course, its Art. 11 with the 'common heritage' and the 'regime' for lunar exploitation are the stumbling blocks. But the MA has other bits that could be helpful.⁴⁵ In the designation of the areas foreseen by MA Art. 7 the 'competent bodies' of the UN are to be consulted, but the actual procedures for designation are not yet established (MA Art. 7.3).

The recommendations of the 2010 IAA Cosmic Study on the Protection of the Environment of Celestial Bodies (PECB) incorporate much of what is needed.⁴⁶ Working outside the concepts of territorial sovereignty, but remaining within those of the jurisdiction of licensing states, any arrangements need to provide sufficient room for states voluntarily to assume obligations and to avoid any implication that these are imposed. The ambit of 'harmful', whether applied to contamination or to interference with the activities of others, should be spelled out, and diminished. There should be duties to avoid debris and contamination and to clean up when either exceeds the restricted ambit of 'harmful'. As to the procedure for the setting aside of areas the model of Annex V to the Antarctic Environment Protocol should be used.⁴⁷ In terms of approving a designation the members of the 'Co-ordination Mechanism' of the space agencies of active launching states should

⁴¹ Specially protected areas were first established for Antarctica in 1964 by the Agreed Measures for the Conservation of Antarctica Fauna and Flora, adopted by the Antarctic Treaty Consultative Meeting (ATCM), No. 1, Canberra, 1961, Item No. IX:

http://www.ats.aq/devAS/ats_meetings_meeting_measure.aspx?lang=e .

⁴² Annex V to the Protocol on Environmental Protection to the Antarctic Treaty, *supra* n. 17., Arts. 4-6. Cf. 'Guidelines for the Committee on Environmental Protection (CEP) Consideration of New and Revised Draft ASPA and ASMA Management Plans' at http://www.ats.aq/e/cep_rop.htm .

⁴³ The Protocol on Environmental Protection to the Antarctic Treaty, *supra* n. 16. See <http://www.ats.aq/e/cep.htm>

⁴⁴ List of Historic Sites and Monuments approved by the ATCM: at http://www.ats.aq/e/ep_protected.htm .

⁴⁵ F. Lyall, 'Exploring Celestial Bodies: Useful Aspects of the Moon Agreement, 1979', IAC-08-E3.4.3; F.G. von der Dunk, 'The Moon Agreement and the Prospect of Commercial Exploitation of Lunar Resources' (2007) XXXII AASL 91-113.

⁴⁶ Citation, *supra* n. 1.

⁴⁷ The requirements of Annex I to the Environment Protocol as to the criteria by which states should operate are not terribly relevant to space. A new set of criteria should be agreed. For Annex I see 30 ILM 1473.

be involved.⁴⁸ They should appoint qualified and competent representatives to form a committee to scrutinise recommendations as to the setting aside of particular sites and/or materials on or within natural space objects for historic or scientific purposes. COSPAR (<http://cosparhq.cnes.fr/>) should be involved as an advisory body and there may be others eligible for that duty. Parties to the new procedure should be able to block recommendations, but their reasoning should be clear and be publicised. Sunlight is a good disinfectant.

⁴⁸ See ‘The Global Exploration Strategy: The Framework for Coordination’: http://www.bnsc.gov.uk/assets/channels/media_centre/Global%20Exploration%20Strategy%20Framework.pdf; <http://www.scitech.ac.uk/Resources/PDF/gesframework.pdf>; http://www.nasa.gov/pdf/178109main_ges_framework.pdf. The agencies involved are ASI (Italy), BNSC (United Kingdom), CNES (France), CNSA (China), CSA (Canada), CSIRO (Australia), DLR (Germany), ESA (European Space Agency), ISRO (India), JAXA (Japan), KARI (Republic of Korea), NASA (United States of America), NSAU (Ukraine), Roscosmos (Russia).