

PROTECTION OF THE SPACE ENVIRONMENT AND LAW

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Abstract

The protection of the space environment is a matter of concern. Terrestrial Environmental Law, both national and international, has developed remarkably, but, other than general principle, little of it is readily transposable to the space environment. An effort should be made to develop an environmental space law, but we must recognise that the agenda of international law-making is fairly full.

Introduction

As I start to write this paper it has been announced that, when it reaches the end of its fuel, the Lunar Prospector is to be crashed into a moon crater in the hope that this will cause the emission of a plume containing evidence of the existence of water on the Moon. Poor Moon! In the last forty or so years, it has often been a target

including for the Ranger and Lunik series of the 1960s. Other probes have been sent to crash into Venus, Mars and Jupiter. In a couple of years the Cassini probe will enter Saturn orbit and the Huygens probe will head for Titan. And all that is apart from the inadvertent results of debris, sent out of Earth orbit by the manner and method of its creation.

Nearer home, as it were, we have also the problem of Earth orbiting debris, about which there is now a growing concern. When I was asked to write this paper, my remit was to deal with the distant environment, that which is more physically remote than Earth orbit, but I have concluded that the question of Earth-orbiting debris, should not and can not be separated from the general question of the space environment. Nonetheless, Earth-orbiting debris is not our main concern: the protection of the environment of our solar system is.

Preliminary

What is Law?

Scholars and others have argued for centuries as to what Law is. I cannot answer that question, or even summarise views, within the compass of this paper. But 'What is Law' is important for us, and we need some basis from which to start.

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For the sake of this paper, Law is the requirement that fact situation A, B and C is followed by consequence D. There is a difference between Scientific Law and Forensic Law. In Scientific Law consequence D always occurs, and if it does not, there is no Law. In Forensic Law consequence D may not always occur, (although it is generally recognised that it should (the 'binding nature' of law, plus the problem of enforcement)), and, by appropriate law-making or decision-making processes, in Forensic Law consequence D may be replaced by consequence E. There is argument in legal theory as to whether the content of Forensic Law is integral to the question whether a law exists. Formalists would say that content is not relevant. Others would say that particular content may remove a 'law' from the category of a binding obligation, and indeed can impose a duty of non-obedience.¹

For our purposes we must investigate whether there is any forensic law dealing with questions of the environment in space, and whether improvements could, should, or might be made. It is important, however, to recognise that there is no point in mere formalism. Indeed it would be damaging to the legal structures that affect space activities for 'legislation' in the matter to be ineffective, unduly visionary and / or widely ignored. A fundamental for any healthy legal system is that its prescriptions are generally obeyed by the bulk of those whom they concern.

What is Environmental Law?

A paradox: on one view (and the best from the stand-point of legal theory) Environmental Law does not exist. Unlike the Law of Contract, or the Law of Delict (Tort) there is no internal doctrinal coherence to Environmental Law. One can point to one or two very generalised principles that undergird part of it - e.g. 'do no harm' - but these are so indefinite that they cannot be characterised as proper propositions of law. The organising principle of Environmental Law, (as of a

number of other subjects such as Family Law or Business Law, which are happily taught in Law Schools), is the object or the set of social problems that which is dealt with. Environmental Law is all the law that deals with environmental matters. The 'environment' is its base.

But what, then, is Space Law? Space Law is no different. It is all the law that deals with things that have a space connection. Environmental Space Law is the Venn diagram overlap of these categories; it is not the logical development of propositions from a simple normative base point. That constrains our inquiry.

Terrestrial Environmental Law is a subject of growing importance. Many legal systems have had rules relating to the use of the environment for centuries. Water is the most common matter in which rule-making is earliest found. Land use, public health and the control of pollution follow. Internationally, pollution controls have led the way, although in recent decades other matters of concern, for example the protection of endangered species, have increased in significance. Pollution in one form or another also seems to be leading the way as a matter of concern in relation to space.

Environmental Space Law

Environmental provision within existing Space Law is minimal. In the basic Space Law Treaties there is not much to go on. International Liability for damage caused by space objects appears in art. VII of the Outer Space Treaty of 1967,² and is further elaborated in the Liability Convention of 1972,³ particularly in its arts. 2-4. However, art. 1 of the Convention makes it clear that the liability and damage involved is personal injury to persons, including loss of life, and damage to property. The environment is not in contemplation.

In formal Space Law there are in fact only two clear provisions as to extra-terrestrial environmental matters, and both refer to contamination. One comes in Art. IX of the 1967 Outer Space Treaty⁴ which lays a duty on its state parties to 'pursue

studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination ...'. The other, art. 7.1 of the Moon Agreement,⁵ provides that '[i]n exploring and using the Moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment, whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise.' Of course, arts. 8 and 9 of the Moon Agreement go on to permit Parties to land on the moon, move across its surface, establish bases and pursue activities on or below the surface of the moon. But while these provisions have an environmental effect, they are not directed towards an environmental purpose.

In the minimal environmental provision in the Outer Space Treaty and the Moon Agreement, we are faced with language which any lawyer would delight to interpret, depending on for whom he is appearing. The statements of Art. IX of the Treaty and of art. 7.1 of the Agreement are so vague that it is difficult to build any definite and unassailable meaning on them. What is 'harmful' contamination or 'adverse' changes to an environment? From human experience it is not likely that all change or all contamination is proscribed by such words. The mere presence of chunks of metal or plastic, baked in ultra violet and other solar radiation, or in extraordinarily low temperatures, or vaporised and massively diluted, is not likely to contaminate.⁶

Further, of course, apart from such sophism, there are matters of law involved. The Moon Agreement, with its paltry level of ratifications (9 as of 1999) can not pretend to affirm propositions that bind other than its parties. But the Outer Space Treaty has a better status. As of 1998, it had been ratified by 93 states, and a further 27 signatory states who had yet to ratify.⁷ As the UN membership was then 185, effectively two thirds of the UN members are parties to the 1967 Treaty, or, having signed but not yet ratified the Treaty, are

bound not to engage in activities contrary to its basic tenets.⁸ That is a help for us. But there is also a strong argument for going further. Based in part on the numbers ratifying or signing, in part on the lack of contrary practice or objection by non-signatory states, and in part on the fact that the UN Declaration of Legal Principles of 1963 which preceded the 1967 Treaty was adopted without vote in the General Assembly, it can be argued that the fundamental or basic notions of the Treaty now form part of Customary International Law, and therefore are binding even on those states which have neither signed nor ratified the 1967 Treaty.

That last sentence is long, but crucial. Art. III of the Outer Space Treaty, and Para 2 of the 1963 Declaration of Legal Principles, state that the exploration and use of outer space is to be carried out in accordance with International Law. We therefore may turn to see whether there are principles of general International Law which might have relevance for our inquiry.

General Principles of International Environmental Law?

As mentioned above, there is a developing body of International Law that deals with environmental matters.⁹ Many treaties and Declarations and similar documents now deal with questions of the environment.¹⁰ In addition one should also look at the work of the International Law Commission both on the area of State Responsibility and on International Liability for Injurious Consequences Arising from Acts Not Prohibited by International Law.¹¹

The traditional starting point for discussing the obligation of a state in regard to the environment is the *Trail Smelter* arbitration between Canada and the US in 1939.¹² There the matter at issue was the deleterious effects of air pollution passing from Canada into the US. The case is often cited as establishing the duty of a state not to permit the use of its territory to the detriment of another state - *sic utere tuo ut alienum non laedas* as the brocard would put it. Other cases have followed, for

example the *Corfu Channel Case* of 1949,¹³ where again a state was found to be responsible for the use of its territory in such a way as to occasion damage to another state. Albania was liable for damage done by mines to UK warships exercising their right of innocent passage through Albanian territorial waters between Corfu and the Albanian coast, and for a failure to warn of the minefields.

But such cases take us only part of the way. In that category of environmental case, there has been damage to the property or other interests of another state by the use of the territory of a state and reparation for injury has been assessed. The principle can be formulated to require a state to act prior to the occurrence of harm, to prevent rather than to compensate. One need not wait for the harm to have occurred. In *Trail Smelter* the arbitral body went on to outline how the smelter's emissions should be controlled in the future. There is clearly a duty to 'prevent, reduce and control environmental harm' where damage may be done to another state.¹⁴ Does that duty go further and proscribe acts which cause damage, where the damage is done to the environment, and not specifically to the property or nationals of a state?

The question of State Responsibility, the circumstances under which a state is responsible at law for actions and resulting damage, including the question of reparation, has been on the agenda of the International Law Commission since 1949 when it was identified as one of fourteen matters in which codification could and should proceed. In 1956 Professor Garcia Amador was appointed Special Rapporteur, and he and his successors produced reports in the following years.¹⁵ Finally a set of Draft Articles on the matter (cited hereafter D.Art.) were provisionally adopted on first reading by the Commission in 1996,¹⁶ and sent to states for their comments.¹⁷ The 1997 and 1998 meetings of the Commission continued work on the topic. It is likely that the Draft Articles will be amended before their adoption as a treaty, and it cannot be predicted whether that treaty will be

successful, but we can use them in this form.

A state is in breach of an international obligation when its conduct does not conform with the requirements of that obligation (D.Art. 16). It is also in breach if it is required to adopt a particular course of conduct, but does not conform to the requirement (D.Art. 21). If it is required to achieve, by means of its own choice, a particular result, and it does not do so, that is also a breach of an international obligation (D.Art. 21.1. and 2). If a state is obliged to prevent a given event, and does not do so, that is also a breach of its obligations (D.Art. 23). These are weighty, if general, statements. However, the main thrust of the Draft Articles on State responsibility is towards damage done to another state. What obligations exist regarding the environment, when the territory, property or personnel of another state is not involved? What about harm of damage to objects or bodies not owned by, and beyond jurisdiction of any state? Space is, according to Art. II of the Outer Space Treaty, beyond the limits of national jurisdiction, for '[O]uter space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.' Damage to the Moon is not damage to a state.

Another Draft Article could be important for the question of duties in respect of areas not under national jurisdiction. This is D.Art. 19, ss.2 of which holds that the breach of an obligation 'so essential for the protection of the fundamental interests of the international community that its breach is recognised as a crime by that community as a whole constitutes an international crime'.¹⁸ Further D.Art. 19.3.d indicates that such an international crime could occur through breach of international obligations 'such as those prohibiting massive pollution of the atmosphere or of the seas.' Such, obviously, will include areas beyond the jurisdiction of states. But is the prevention of damage to a celestial body 'essential for

the protection of the fundamental interests of the international community’?

So much for the 1996 Draft Articles on State Responsibility, but we can also gain from other work being done by the International Law Commission in a cognate field. In 1974 the Commission acceded to a suggestion by its then Rapporteur that, apart from ‘normal’ matters of State Responsibility in which the act causing damage was unlawful, there was also a category of International Liability for Injurious Consequences Arising from Acts Not Prohibited by International Law. Work is proceeding on that front as well. However, the ambit of the Draft Articles that are the present outcome of that endeavour, although centring on questions of prevention, has been restricted to the ‘Prevention of Transboundary Damage from Hazardous Activities’, and clearly refer to harm done to another state,¹⁹ not to damage or harm caused outwith all territorial jurisdictions to the environment *qua* environment..

For that matter we must turn for the present to other documents.

In 1972 the United Nations convened a Conference on the Human Environment in Stockholm. This Conference was a watershed in environmental concern, and many developments as to international environmental law can be traced to the discussions there. For our purposes Principle 21 of the Declaration of the UN Conference on the Human Environment is very important. It states:

‘States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility 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.’ (Emphasis added).

The next Principle, Stockholm Principle 22, goes on to require that States cooperate in developing further international law as to liability and compensation for damage caused ‘by activities within the jurisdiction or control of such States to areas beyond their jurisdiction’. At Stockholm, therefore, some consideration was given to areas ‘beyond the limits of national jurisdiction’, a category which certainly includes Space.

Of course, the Stockholm Declaration of 1972 is not binding law; it is but the Declaration it states it is. However, many take it as an expression of the international law of its time, and that view is buttressed by subsequent history. Similar language is to be found in a number of later agreements and Declarations. The World Charter for Nature of 1982, composed under the auspices of the International Union for the Conservation of Nature (IUCN), was adopted by the UN General Assembly.²⁰ The general principles of the Charter (arts. 1-5) are framed to cover ‘all areas of the earth, both land and sea’ (art. 3), and require respect for nature, and the non-impairment of its essential processes (art. 1). Activities which might have an impact on nature are to be controlled and the best available technologies that minimise significant risks to nature or other adverse effects are to be used (art. 11).

From the generalities of declarations and other well-intentioned resolutions, one can turn to more specific provisions to be found in treaties. Not all of these have come into force, but the fact that states are willing to negotiate such texts itself shows the drift of opinion in such matters. Where such a provision is in force, the drift has clearly accelerated. Thus the 1991 Protocol to the Antarctic Treaty on Environmental Protection, (not yet in force), represents an endeavour to deal with the environment of an area which has been (for the present at least) set aside from territorial claim. Other agreements among the Parties to the Antarctic Treaty deal with other environmental questions, and, while these agreements bind only as between their Parties, one can detect a pattern. There is also the Convention on the Conservation of

Antarctic Marine Living Resources of 1980. Again, the 1982 Law of the Sea Convention²¹ contains environmental provisions which are applicable in areas beyond national jurisdiction. Thus in its art. 194 which deals with marine pollution, ss.2 requires states to 'take all measures necessary to ensure that activities under their jurisdiction or control' do not cause damage, and that pollution does not spread beyond their areas of sovereignty, and ss.5 makes special provision as to rare or fragile ecosystems and depleted, threatened or endangered marine life situated anywhere.

One could list more.²² However, we have seen enough to draw the general point that, within the International Law relating to the terrestrial environment, an increasing number of international treaties and declarations contain provisions as to the protection of the environment beyond national jurisdiction. To these one must add the work of the United Nations Environmental Programme (UNEP),²³ and of the UN Conference on Environment and Development (UNCED) and its Agenda 21, an action programme on a variety of environmental matters adopted by UNCED.²⁴ While these treaties, declarations and other activities are normally each directed to a particular matter, one can see developing a general duty in international law towards the preservation and conservation of the environment, both within and outside areas of national jurisdiction.

Indeed, we can go further. The ideas of the Stockholm Conference were reinforced, and reinterpreted by the Rio Conference of 1992, Principle 2 of whose Declaration repeats the tenor of Principle 21 of Stockholm. Rio Principle 2 modified the Stockholm language by adding a state's own developmental policies to the 'environmental policies' a State could lawfully follow. This was, perhaps, a step backwards. Indeed, it must be said that, although the Stockholm Declaration has language in Principles 8 and 10-12 as to the importance of development and the eradication of poverty, the Rio Declaration, and some of the Declarations made between

1972 and 1992 seem to be even more centred more on human needs, and in particular those of the developing countries. The right to development (Rio Principle 3) might have a higher status than the general concept of the environment, and environmentally harmful development might be excused as being justified by development considerations. However, while that bias towards 'human needs' has come in, it does not displace the general environmental point made in these many texts. Environmental concern, to the point of imposing environmental duty, has become a matter of law. Thus in its Advisory Opinion of 1996 on the *Legality of the Use by a State of Nuclear Weapons in Armed Conflict* the International Court of Justice expressly states:

'The Court recognises that the environment is under daily threat and that the use of nuclear weapons could constitute a catastrophe for the environment. The Court also recognises that the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn. The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment.'²⁵

A year later, in another case involving the environment the Court expressly quoted the above statement introducing by saying that it had 'recently occasion to stress, ..., the great significance that it attaches to respect for the environment, not only for States but also for the whole of mankind'.²⁶

The idea of a general duty as to the environment, and not confined to a body of duties regarding the avoidance of harm to the personnel or property of other states, has therefore been accepted. There is a duty arising from the common interest of mankind in the avoidance of harm to the planet on which we live. Of course, the phraseology used by the Court has an

anthropocentric reference, but I would suggest that it need not be so confined. Harm done to 'generations unborn' could well include the degradation of our space environment, both near and far.

Global Commons

Another concept developing in International Law, which has relevance for us, is that of the Global Commons. Crudely, this is the idea that there are portions or aspects of the Earth, which are not subject to state sovereignty, either at all (such as the oceans), or in the normal way of thinking of such things (such as the atmosphere, though some of it lies within the airspace of a state). These areas or elements are increasingly considered to be held in some sort of trust for the whole of mankind, although they are not under the sovereignty of any state. Space would seem to be an obvious example, set aside from national sovereignty as it is.²⁷ If the concept of 'global commons' stands, it will certainly consist in part of areas beyond national jurisdiction, thus solving some of the problems encountered above. Clearly a duty to respect the environment of a global commons could be inferred from other International Environmental Law, even in the absence of a clear treaty to that effect.²⁸

The Content of Environmental Duties

But how is respect for and the prevention of harm to the environment to be achieved? Rio Principle 13 affirmed Stockholm Principle 22, imposing a requirement to develop national environmental laws as well as international law, but also calls for States to act 'in an expeditious and more determined manner' in relation to international law on the matter. What does this mean? What are states to do municipally and internationally?

Unfortunately, though one can extrapolate the generality from declarations and environmental treaty provisions, and despite the words of the International Court of Justice quoted above, the content of a state's duty as to the environment remains

indefinite. Reviewing the many treaties that now exist on this environmental question and on that, one can say that there is an obligation in international law as to the prevention of harm to the environment, and that states have to exercise 'due diligence' in so framing and enforcing their laws and regulations to secure the environment.²⁹

But the treaty regimes are usually insufficiently specific to crystallise into law which can be applied to polluters, and there is little enforcement mechanism.³⁰

Treaties regimes place the onus on states to adopt appropriate legislation, and within that onus there is usually the opportunity for a state to permit some environmental effects which involve a degradation of the environment. Something less than a complete ban is usually allowed. In many instances it is left to the state to decide what happens. In others there may be reference to some international standard setting body. For example, within the arena of civil aviation International Standards and Recommended Practices are adopted by the Council of the International Civil Aviation Organisation, and these now include provisions as to noise and other engine emissions. Similarly the International Maritime Organisation issues advisories as to permissible emissions into the marine environment.

The Precautionary Principle

Another relevant element of terrestrial Environmental Law which requires mention, argues in favour of a harder content to international environmental duty than one might think given what is written above. This is the 'Precautionary Principle'. Simply it is the idea that in environmental matters it is better to be safe than sorry. It is better to take precautions which may not be needed, than to fail to take them and risk unfortunate consequences. It is certainly found in municipal Environmental Law, and also is making its way in International Law.

The Environment of Space

Of course, little of what has been outlined above can be readily transferred to questions of Outer Space. But, notwithstanding my views indicated in the Abstract written prior to researching for this paper, there is at least a general concern as to the environment, which is certainly helpful.

For Space, we can, I think, say that the general duties laid on states as to the protection of the terrestrial environment, and the avoidance of harm to it, could and should be extended to activities in Space. This is in consequence of the duty of States to authorise and to supervise on a continuing basis their own activities and those of their non-governmental entities (Art. VI, Outer Space Treaty), and the fact that the exploration and use of outer space, including the moon and other celestial bodies, is to be carried out in accordance with International Law (Art III, Outer Space Treaty). We can also suggest that the Precautionary Principle should be applied as states license and supervise activities in space.

As far as Earth Orbiting Debris is concerned, the various references in terrestrial International Environmental Law as well as in the International Law Commission's Draft Articles both on 'State Responsibility', and on 'International Liability for Injurious Consequences Arising out of Acts not Prohibited by International Law (Prevention of Transborder Damage from Hazardous Activities)'³¹ can be built on. The duty to protect the environment of areas beyond the jurisdiction of states could well extend to Earth orbit.³² In one respect we already have a harbinger of such a duty in operation, - the parking of some spent satellites in orbits remoter than the geostationary. It is practice to push older defunct geostationary satellites into such orbits, if not to try to send them on a sunwards course. Again the UN Principles Relevant to the Use of Nuclear Power Sources in Outer Space sheds some light on the concept of a parking orbit, Principle 3.2

(a)(ii) and 3.2.(b) speaking of a 'sufficiently high' orbit in which a satellite may stay until well after its nuclear fuel has decayed.

These are promising examples, and may well be the environmental duty at work. The present concern as to Earth Orbiting Debris should trigger a further compliance with a duty not harmfully to degrade at least the lower Earth orbital area. That will not deal with existing pollution, but could have future effects.

However, it is rather more difficult to argue that the whole solar system could be covered by such a generalised duty. The matter is not such as could be considered to amount to an international crime in the definition adopted by the International Law Commission's D.Art. 19, ss.2 referred to above. It is not a matter 'so essential for the protection of the fundamental interests of the international community that its breach is recognised as a crime by that community as a whole constitutes an international crime'.³³ There are therefore problems in seeing how such a duty could be enforced, for the idea of some sort of international *actio popularis*, (an action brought by one to enforce a duty owed to many or the population as a whole), has not yet gained full acceptance in International Law.³⁴ If, therefore, we are to seek to establish a legal duty in relation to the debris and abandoned machinery which we may leave on the Moon and other celestial bodies, other steps should be sought.³⁵

Of course, the best way in which to achieve International Law in precision, is through the articulation of the required rules in a formal treaty, accepted by as many states as possible, and certainly including all states which are space-competent. Short of that the next best is a set of Principles elaborated through the Committee on the Peaceful Uses of Outer Space, and then adopted, preferably without vote, by the General Assembly of the United Nations.³⁶

If the international community is willing so to do, it would be desirable that questions of orbital debris and of the potential contamination of or harm to celestial bodies, including the Moon, were to be tackled in a single document.³⁷

However, I close with two caveats. One is that the agenda of the relevant law-creating agencies is fairly full. It would be matter of persuasion to get the question of the Space Environment included on them, particularly if the matter does not seem all that important to governments.

The second caveat is, from the point of view of an academic, more important. An ineffective law, one which is generally disregarded, is not only ineffective, but also is damaging to the legal system of which it forms part. My Preliminary 'What is Law?' makes the point. We are not dealing with a law of science, where what the law says will happen, happens without further ado. We will need human action. The mere enactment or adoption of phrases as to a duty to respect or safeguard the environment, if it is not followed by compliance on the part of the space-competent states, would be a worse result than just letting things go on as they are. As it is, the practical problems of near earth orbit debris are dictating action on the part of those who design, launch and operate space objects. The effect of scientific probes on the Moon, Venus, Mars, Jupiter or Saturn, is so minimal as not to qualify as harmful, and therefore could be left for a few decades.

If we are to have Law, its observance must be assured.

NOTES

¹ Thus in International Law there is the notion of *ius cogens* which prohibits conduct such as genocide, and *per contra* imposes a duty not to obey instructions or laws aimed at genocide.

² Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies. (1968) 610 UNTS 205; (1968) UKTS 10, Cmnd. 3519; 18 UST 2410, TIAS 6347; 6 ILM 386; 61 AJIL 644.

³ Convention on International Liability for Damage Caused by Space Objects, 29 March 1972, 961 UNTS 167; (1974) UKTS 16, Cmnd. 5551; 24 UST 2389, TIAS 7762; (1971) 10 ILM 965; (1971) 66 AJIL 702.

⁴ Cited n. 2.

⁵ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, UN Doc A/34/664. Nov. 1979; UN Doc A/34/20 Annex 2; UN Doc. A/RES/34/68; (1979) 18 ILM 1434.

⁶ If we do get a Moon-base, it will be necessary to ensure that the base is properly secured from environmental interaction with the Moon itself. The state of the present environment round the US Base at the South Pole is not reassuring. In one of his stories, I think it is Arthur C. Clarke who hypothesises that a discarded sandwich turns the Moon into green cheese. It may be: certainly in his 'Before Eden' in *Tales of Ten Worlds* (1962) life on Venus disappears, poisoned by garbage from an Earth expedition.

⁷ Report of the Standing Committee of the International Institute of Space Law on the Status of International Agreements Relating to Activities in Outer Space, A.D. Terekhov, Chairman, (1998) 41 *Proc. IISL* 292-302.

⁸ Cf. art. 18 of the Vienna Convention on the Law of Treaties, which may be taken to state the Customary International Law on the duty of states with regard to treaties which they have signed but not yet ratified. The Convention, which the US has not yet ratified, is available as 1155 UNTS 331; (1968) UKTS No. 58, Cmnd., 7964; (1969) 8 ILM 679; (1969) 63 AJIL 875.

⁹ P.W. Birnie and A.E. Boyle, *International Law and the Environment*, (Oxford: Clarendon Press, 1992); P. Sands, *Principles of International Environmental Law, I: Frameworks, Standards and Implementation*, (Manchester: Manchester UP, 1995); J. Barros and D.M. Johnston,

The International Law of Pollution, (London and New York: The Free Press, Macmillan Publishing Co. Inc., 1974).

10 A good single volume source of materials down to 1994 is P.W. Birnie and A.E. Boyle, *Basic Documents on International Law and the Environment*, (Oxford: Oxford UP, 1995). See also n. 22.

11 The codification of International Law has been the responsibility of the International Law Commission since that body was set up within the UN structure in 1947 by UNGA Res. 174(II) of 1947. Codification involves the development and revision of the law, not its mere consolidation. Articulation of the propositions that may be derived from the many sources of International Law, and from the work of commentators is a difficult business. While the work of the Commission cannot be taken as fully expressing the law, they represent the considered views of major scholars, review the case law and legal writing on the matter, and, for our purposes, Articles drafted by the Commission can be cited for convenience as succinct statements, albeit they may be revised before final adoption. Further the work of the various Rapporteurs to the Commission are invaluable summaries of the state of legal thinking at the time of submission of their reports.

12 *The Trail Smelter Arbitration* (US v Canada) 1938/41 3 RIAA 1905.; (1939) 33 AJIL 182; (1941) 35 AJIL 684.

13 *The Corfu Channel Case*, (UK v Albania), 1949 ICJ Rep. 1.

14 Birnie and Boyle, above n. 9 at 89.

15 Garcia Amador was succeeded by Roberto Ago, then Willem Riphagen and finally Gaetano Arangio-Ruiz. James Crawford was appointed Rapporteur in 1997, after the adoption of the Draft Articles of 1996, as to which read on.

16 The 1996 Year-Book of the International Law Commission is not

available as I write, but the text is on the UN website as www.un.org/law/ilc/reports/1996/chap03.htm. It is also *in gremio* of the US Comments, cited n. 17.

17 The US Government's comments are printed as International Law Commission Draft Articles on State Responsibility, 1998 37 ILM 440-67.

18 Reference point, n. 33 below.

19 See Ch. 4 of the 1998 Report of the International Law Commission at www.un.org/law/ilc/reports/1998_chp4.htm.

20 UNGA Res. 37/7; 1983 22 ILM 455. 111 states voted in favour, the US against, and 18 abstained on the ground that their sovereignty over their natural resources might be impaired.

21 United Nations Convention on the Law of the Sea, Montego Bay, Jamaica, 10 December, 1982, A/CONF.62/122; UK Misc No. 11, Cmnd. 8941; 1982 21 ILM 1261-1355. The later amendment of the Convention does not affect the provision mentioned immediately next.

22 Cf. the content of Birnie and Boyle, above, n. 10. See also *International Protection of the Environmental: Treaties and Related Documents*, B. Ruster and B. Simma, eds., 31 vols. (New York: Oceana, 1975-83).

23 UNEP was established following the 1971 Stockholm conference on the Human Environment, and endeavours to encourage and coordinate actions by national and regional non-governmental bodies on environmental matters. UNEP was the source of the concept of 'sustainable development'.

24 UNEP was instrumental in the holding of the UN Conference on Environment and Development (UNCED) which adopted Agenda 21. Agenda 21 is an action programme directed particularly to sustainable development and the proper use

and management of environmental resources. See *Agenda 21 and the UNCED Proceedings*, 6 vols., N.B. Robertson et al. eds., (New York: Oceana, 1992-3).

25 *Legality of the Use by a State of Nuclear Weapons in Armed Conflict*, Advisory Opinion, 8 July 1996, (1996) ICJ Rep. Para 29: also printed as 'International Court of Justice: Advisory Opinion on The Legality of the Threat or Use of Nuclear Weapons', 1996 35 ILM 809.

26 *Case Concerning the Gabčíkovo-Nagymaros Project (Hungary / Slovakia)*, ICJ 25 September 1997, at Para 53 (not yet reported in ICJ Reps), 1998 37 ILM 168-242.

27 Outer Space Treaty; Art. II; cf. V. Kopal, 'Outer Space as Global Common' (1997) 40 *Proc. IISL* 108-16.

28 Cf. K. Gorove, 'Protection of the Global Commons: New Customary Law?' (1998) 26 *J. Sp. Law* 208-13; V. Kopal, n.27.

29 'Due diligence' has been a matter of discussion. Cf. D.Art. 3 of the International Law Commission's 1998 Report, Ch. IV, on 'International Liability for Injurious Consequences arising out of Acts not Prohibited by International Law (Prevention of Transborder Damage from Hazardous Activities)', 'Prevention' and Commentary thereon; available at www.un.org/law/ilc/reports/1998/chp4.htm. Cf. also. Birnie and Boyle cited supra n. 9 at 92-4.

30 As noted below, (n. 34) it does not yet appear that a generalised 'duty' can be enforced by one state or any other international person, against another. The most that can be hoped for is an Advisory Opinion of the International Court, and the persuasive effect of its comments.

31 Cited above respectively nn. 16 and 19.

32 Cf. Resolution 5 of the International Law Association's Sixty-Sixth Conference, held at Buenos Aires in 1994, which

annexes an International Instrument on the Protection of the Environment from Damage Caused by Space Debris. See *International Law Association, Report of the Sixth-Sixth Conference*, (London: Int. Law Assoc., 1995) 7-15, with Report and Final Text of the Space Law Committee of the ILA, M. Williams, ed., at 304-25.

33 See text above at n. 18.

34 See P. Sands, cited above n. 9, at 150-4, 'International enforcement: Damage to the environment in areas beyond national jurisdiction'.

35 I use the term 'abandoned' colloquially. Under Art. VIII of the Outer Space Treaty, a launching state retains jurisdiction and control over an object on its registry of objects launched into outer space. In law such objects cannot be abandoned, to become *res nullius*.

36 On the effects of such a Resolution see B. Sloane, 'General Assembly Resolutions Revisited (Forty Years Later)' (1987) 58 *BYIL* 39-130; A. Terekhov, 'UN General Assembly Resolutions and Outer Space Law' (1997) 40 *Proc. IISL* 87-107.

37 Cf. V. Kopal, 'Present International Law Principles Applicable to Space Debris and the Need for their Supplement', in *Proc. Second European Conference on Space Debris*, Darmstadt, 1997, [ESA SP-393] (Noordwijk: ESA, 1997) at 739-747; and M. Benko and K-U Schrogl, 'Space Debris in the United Nations: Aspects of Law and Policy', *ibid* at 749-57.