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ETHICAL AND LEGAL CONSIDERATIONS IN PREVENTING THE CONTAMINATION OF SPACE

Abstract

The legal concept of individual responsibility towards preserving the integrity of environmental commons can be arguably traced back at least as far back as nuisance limitations in common law (see, for instance, Aldred's Case in 1610), with further roots in medieval-period laws concerning responsible use of appurtenances on common land. Regardless of its precise date of origin, the principle of balancing individual gain with public interests is a matter deeply ingrained in law and ethics alike throughout the ages, though exactly what responsibilities are ethically owed in protection of the environment – and are legally enforceable, especially on an international stage – are still a matter of debate.

The space age, and particularly the issue of biological contamination in space exploration, have highlighted the present and emerging relevancy of addressing the ethical and legal responsibilities entailed in exploring and colonizing previously undisturbed regions of space, especially those which have the potential to harbor life. While the scientific importance of charting the unexplored frontiers of space and better characterizing the universe in which we reside in means that the introduction of spacecraft into otherwise undisturbed environments (i.e. outer space and the environments of other planets) is a necessity, the extent to which environmental disruption can be considered to be necessary for the common good of humankind, or otherwise responsible use of a shared space, has not been consistently identified in the scientific or legal literature. Current planetary protection policies, such as the COSPAR principles that expand on the 'harmful contamination' concept in the Outer Space Treaty, also can be said to present ethical conundrums involving the prioritization of immediate human interests (e.g. minimizing the burden of exploration) over long-term environmental protection.

This paper discusses some of the key legal and ethical issues concerning the responsible use of space from an astrobiological and planetary protection perspective, inclusive of transboundary responsibilities to limit the disruption of potential exoplanetary biospheres, the protection of shared and competing scientific interests, and intergenerational equity. Furthermore, this paper provides discussion *de lege ferenda*, and uses existing legal principles (*lex lata*) to highlight developments needed for space law to appropriately establish and enforce ethical responsibility and liability standards regarding the biological integrity of space-based environments. Recommendations are also provided for legal/ethical principles which should be adopted on an international level in the near future to ensure the adequate protection of public interests and space-based assets covered under the 'common heritage' principle.