# Aff K Answers

## Debate over Space Good

### Debating over space policy is good – the alternative kills US space leadership and action

Robert 89 – Christopher Roberts, Controller and General Counsel to Atlantic Aerospace Electronics Corp, November 17-18 1989, “NASA and the Loss of Space Policy Leadership,” Technology in Society, Vol. 12, pp. 139-155

Since the close of the Apollo program, the United States has not had a coherent space policy. In fact, a strong argument can be made that the Apollo Program itself was not part of a coherent policy but was instead, a one-shot extravaganza. The past 20 years have shown that the American taxpayer is willing to support a steady-state level of planetary science/exploration and manned space activity, but not much more. Despite frequent “Policy” pronouncements from the White House, there is still no new national consensus on space. By default, **NASA has taken a lead in the public debate over space policy by advocating**, and in some cases commencing procurement of, **large space projects in advance of** achieving **public policy consensus**. This is not an ideal role for NASA. NASA is an implementer of policy; it should not be a maker of policy

A policy is more than just a presidential speech. A policy forms the framework for numerous resource allocation decisions and provides the overall direction of a program. A policy is, or should be, a national commitment to a stated goal. America is a great nation and SHOULD accept the leadership responsibilities of a great nation. However, the American people do not quite see the connection between leadership and the space program desired by NASA. The US political leadership must either educate and persuade the American public to accept the connection, or else scale down the proposed space projects to match the public’s willingness to provide funding. Until the US agrees on a goal for the space program which enjoys broad public support, the US cannot realistically hope to regain a leadership position in space exploration.

### Not debating over space passes leadership to other countries

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The Apollo program was a clear program success but a bureaucratic failure. The program was cancelled and NASA’s budget, staff, and prestige all suffered. By contrast, the Shuttle and Space Station programs are bureaucratic successes. They both have large and growing budgets and staff. As a program, however, the Shuttle was, at best, a limited success and, arguably, a failure as measured against the initial promises of its supporters. The SD1 program is also an example of a bureaucratic success and a program muddle. Another way to state the problem is that NASA does not want a space station, they want a space station *program.* One sign that the space station program has excessive bureaucracy is that the program has grown so much that there is already a private newsletter designed to keep program participants informed.

It is important to recall the famous dictum that “those who ignore the lessons of history are doomed to repeat them.” Regrettably, NASA appears to have decided to ignore history. As discussed below, the Space Station program is repeating the mistakes of the SST and Shuttle programs. In planning the Moon-Mars mission and the Advanced Shuttle programs, NASA has again opted for pursuing bureaucratic success rather than program success. For example, NASA has already issued a contract to draft a users’ manual for the Shuttle C (a proposed advanced shuttle concept) program, which has not even reached the critical design stage. This will merely perpetuate the current program stagnation and, in effect, help pass leadership in space to other nations and groups of nations.

### Reaching public consensus over space policy is the only way to maintain US space leadership

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Predicting the future is an art, not a science. For the purposes of this paper, predictive accuracy is less important than the internal consistency and plausibility of the arguments made. The operative premise of this paper is that to be successful, the program objectives and funding requirements of future space projects must be scaled to the level that the public consensus will support. In practical terms, that consensus translates into a steady budgetary commitment to basic research and technology development with enough manned spaceflight activity to satisfy the public craving for adventure. In my view, the future of the US space program depends on whether the key decision-makers - NASA, Congress, and the White House - can understand the nature of the political consensus and design programs that work with it, rather than against it. If the answer is no, then the American space program will continue to drift, passing leadership by default to Europe and Japan. If the answer is yes, then America can regain its leadership role in the international space program, albeit as first among equals, not the unchallenged pioneer of the Apollo days.

### Preventing debate over space cedes the political (?)

Robert 89 – Christopher Roberts, Controller and General Counsel to Atlantic Aerospace Electronics Corp, November 17-18 1989, “NASA and the Loss of Space Policy Leadership,” Technology in Society, Vol. 12, pp. 139-155

Two programs that are likely to be successful even in this pessimistic scenario are the planetary exploration program and the Mission to Earth remote sensing program. The public excitement over the pictures returned by the Voyager probes has apparently convinced the decision-makers that increased funding in this scientifically important and prestigious area is justified. US leadership in planetary exploration will be maintained. The Mission to Earth program will proceed until the volume of data proving the extent of industrial pollution damage to the environment provokes a backlash from American industry that might prompt Congress to reduce funding. The recent US unwillingness to agree to freeze carbon dioxide pollution levels is testimony to the political power of American industry. Whether Green politics can muster countervailing political support in the US, and how quickly, is an open question.

### Debating about space is the only way to integrate all sciences, which is best for education – failure to do so minimalizes humanity

Pass et al 10 – Jim pass, Ph.D. in sociology and lecturer in sociology, Christopher Hearsey, ARI Director of Programs and Special Projects, Simon Caroti, Ph.D. in literature and ARI Director of Educational and Public Outreach, September 2 2010, “Refining the Definition of Astrosociology Utilizing Three Perspectives,” American Institute of Aeronautics and Astronautics, http://www.astrosociology.org/Library/PDF/Space2010\_3Perspectives.pdf

As stated, we have passed the point in which a focus on astrosocial phenomena by a single social or behavioral science field is justifiable. A great hindrance to the field of astrosociology would occur if various social science fields began competing to become its “official” home in academia. We can avoid such a useless and harmful bout of conflict by sharing the field through a cooperative approach, through a collaborative effort aimed at bringing together the best of what each science can add to the study of astrosocial phenomena. In this way, we can maximize the potential for building the greatest body of knowledge possible. On the other hand, infighting can only lead to a minimalization of the effort to understand humanity’s place in the universe and all of its fascinating corollaries.

Defining a new field inevitably creates issues related to how it fits with existing fields and disciplines. Unless the field is so unique that nothing exists to share any part of its subject matter, a new field will share existing areas of content. Such is the case with astrosociology. Many of the space-related fields that focus nearly exclusively on biology, geology, astronomy, or cosmology – as examples – fail to pay much attention to their impact on human beings and their societies. What makes astrosociology unique, despite the fact that it does share considerable existing subject matter, relates to its focus on any topic that deals with the combination of humans and space, i.e., its focus on astrosocial phenomena.

Existing fields such as space law and policy, and even astrobiology, do share overlapping contents, so what does this mean for the scope – and boundaries – of astrosociology? Astrosociology is different from the other fields in that it takes a social-scientific perspective and utilizes a multidisciplinary approach. It also binds existing fields together with a focus on the relationship between space and humanity. The human dimension serves the central conceptualization, or the glue that ties often-disparate topics together. Similarly, it alters existing space-related fields to some extent by adding the focus of astrosocial phenomena.

An easily understood definition would also benefit efforts to collaborate between the space and social science communities. Fields and disciplines within the space community cannot continue without considering the human dimension and, in fact, they have not done so even if on an informal basis. Humans were always in the equation in various facets. However, they were secondary to the analysis. The formal acknowledgment of a dedicated social science field – that is, astrosociology – has made it possible to collaborate with a tangible group of social scientists rather than pioneering individuals, which has allowed for a more inclusive interaction among all types of scientists. Both branches of science can now finally work together, bridging the Great Divide to allow for a balance between solving engineering problems and conducting human-based research as a single unified effort.

### Specifically policy debate is good because we can imagine the astrosocial phenomena of the plan – it’s the only forum in which we can do this

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At a high level of conceptualization, the *astrosociological imagination* – borrowed from sociologist C. Wright Mills’ (1959) concept of “sociological imagination” – consists of a special insightful way of looking at the world in which connections are made between macro-level astrosocial forces and the actions of individuals.15 It involves the ability to separate personal biography from historical social change. Possession of the astrosociological imagination means that the individual understands that he or she does not exist in isolation, but as part of larger space-related forces that influence him or her.

In my original essay on astrosociology,16,17 I noted the importance of applying the sociological imagination to understanding the astrosocial world.

“Bringing sociology into this area of inquiry is largely unrealized despite the irrefutably significant effects of astrosocial phenomena. Therefore, the application of the *sociological imagination* (Mills 1959) to understanding the relationship between the typical citizen and astrosocial phenomena remains vital due to its ongoing, and arguably increasing, relevance.”18

This observation applies to bringing in all of the social sciences as well.

The astrosociological imagination relates to the definition of the field in the sense that it provides a framework for analyzing astrosocial phenomena. A definition is useless unless one possesses the ability to use the lens of the astrosociological imagination. In other words, the ability to recognize astrosocial phenomena is vital to studying their characteristics as well as their impact on individuals and society.

A good astrosociologist must be able to understand his or her connections to the social fabric beyond the obvious events recognizable on the surface that often hide much more complex phenomena from the uncritical eye. The average person lacks the astrosociological imagination. It takes an earnest effort to develop it, so we must not assume that an understanding of the definition of astrosociology represents the end of our preparation to become competent astrosociologists. It is just the beginning.

## Space Policy Inevitable

### Space policy inevitable – debating it makes it better though

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As a result of making the Lunar Orbit Rendezvous decision, after the successful Apollo XI landing the US had no permanent, manned presence in space that could sustain public interest and, hence, no further political reason for an active Apollo Moon Landing program. Accordingly, the manned space program was virtually terminated. The remainder of the government had little interest in pursuing space science and exploration for its own sake. Nor was there a public consensus in favor of such a program, certainly not at the peak Apollo funding level. However, if a manned space station had been in existence in 1969, it would have attracted steady participation from industry and universities around the country, which would in turn have created a sufficiently strong constituency to persuade Congress (and a reluctant Nixon administration) to continue funding manned spaceflight and space exploration, albeit at a lower level than the Apollo program. The existing Saturn V launch vehicles and the DynaSoar manned spaceplane would have made a small manned space station technically viable at a politically sustainable cost.

Nonetheless, NASA proceeded on the assumption that such a consensus in favor of ambitious space exploration did exist and continued to press, first during the Nixon administration and, then, in subsequent administrations, for funding of large, ambitious manned space exploration programs.2 It should come as no surprise that these proposals were, and still are, controversial and underfunded. The public support for the US Space Station program is quite weak. The public was barely willing to support the program when the estimated cost was only $8 billion. Now that more thorough cost projections are estimating the cost at over $30 billion, public support is even more tenuous, as reflected by increasing Congressional scrutiny and criticism. However, the way in which recent projects have been managed suggests that NASA will do almost anything to preserve their program bureaucracies, even at the expense of the program objectives. The management of the Shuttle and Space Station programs has, in large part, served to maintain a marching army of NASA bureaucrats at the expense of science and research programs.

### Space exploration is inevitable and good

Pass et al 10 – Jim pass, Ph.D. in sociology and lecturer in sociology, Christopher Hearsey, ARI Director of Programs and Special Projects, Simon Caroti, Ph.D. in literature and ARI Director of Educational and Public Outreach, September 2 2010, “Refining the Definition of Astrosociology Utilizing Three Perspectives,” American Institute of Aeronautics and Astronautics, http://www.astrosociology.org/Library/PDF/Space2010\_3Perspectives.pdf

Theoretically, characteristics of spacefaring societies include most people on Earth affected by space in a myriad of ways, societal institutions intertwined with astrosocial phenomena in addition to more people traveling, working, and living in space.22 Astrosocial phenomena do not dominate how our societies on Earth function. Astrosocial phenomena are not ubiquitous to everyday social life or in the functioning of our institutions. Today, the most advanced societies on Earth are merely space-capable societies, and thus just at the beginning of the continuum leading to true space societies on Earth.23

In the current context of reviewing the relationship between outer space and human society, the growing influence of space on human populations on Earth and in space will become increasingly significant to humanity’s future. The two-way relationship between Earth/humanity and space includes two directional forces that will result in a bifurcation of the human species and eventually the creation of at least two independent evolutionary paths. Thus, Earth and space affect each other in two related causal directions. One relates to what happens when humanity leaves Earth into various space ecologies while the other concerns what happens when space impinges on Earth, both directly and indirectly. The former leads to migration into space while the latter results in humans remaining on Earth to cope with their existence in part through the utilization of space resources.

When looking at the cause-effect relationship in terms of what causes humanity to favor migrating into space and leaving Earth, the focus becomes phenomena on Earth that compels humanity to favor the unknown over the known, a set of social forces produce the imperative to settle the space environment.24 The causal arrow is from Earth to space, indicating a pattern of emigration from Earth. For the current epoch, the focus remains Earth-centric because no humans remain forever in space. The lure of additional “land” may cause some groups to leave Earth. Such things cause a portion of humanity to explore space, work and play there, and eventually stay there indefinitely. The intent to live in space outweighs the familiarity and safety of living on Earth. People elect to abandon Earth’s surface for a variety of reasons. Examples include overpopulation, energy and resource scarcity, global warming, the fear of destruction from super volcanoes and asteroids, and religious persecution and conflict. Another illustration involves astronomers who may wish to relocate themselves on the far side of the Moon or an even further object in order to construct and operate a telescope without interference from Earth’s atmosphere. In this example, scientific discovery lures astronomers away from Earth.

## Space Exploration Good

### Space exploration solves social problems

Pass 5 – Jim Pass, Ph.D. in sociology and lecturer in sociology, August 8 2005, “Astrosociology and the Space Community,” The Space Review, http://www.thespacereview.com/article/424/1

This definition becomes more understandable from to a member of the space community when contrasting the difference between *astrosocial phenomena* and *space phenomena*. An undiscovered asteroid, for example, involves no astrosocial phenomena because the actions of human beings, whom are necessary to establish social patterns, remain unrelated to this space phenomenon. However, as soon as even one human being discovers the asteroid, then one can say that astrosocial phenomena exist. The discovery itself would occur within an organization, and would thus be regarded as an astrosocial phenomenon, as would be all subsequent social/cultural patterns related to the asteroid; including devising the means of preventing it from striking the Earth should a collision course become an issue. It remains common during this early phase of the space age that most astrosocial phenomena occur on Earth. Astronomy and all the other space sciences involve behavioral patterns characteristic of astrosocial phenomena, and their efforts (including their implications to society) fall under the purview of astrosociology.

Emphasis of the concept of “outer space” is important as part of the definition of astrosociology because sociology has traditionally defined space as social or geographic space in one form or another. Astrosociology focuses on the relationship between space and society, including the interactions involved and their contributions to social change. Non-astrosocial phenomena interact with social phenomena and thereby produce social change affecting both efforts in space as well as all elements of society on Earth. With this in mind, a particular society can be broken down into two theoretical parts to gain better understanding of the dynamics involved: the *astrosocial sector* includes social groups that conduct astrosocial activities while the *non-astrosocial sector* includes all other groups unrelated to astrosocial phenomena. The two interact to produce a particular quantity of the social change within a particular society, increasing as space exploration becomes more essential to meeting social needs and solving social problems.

## Space in Social Life Good

### Applying space exploration to social life is key to avoid their impacts

Pass 5 – Jim Pass, Ph.D. in sociology and lecturer in sociology, August 8 2005, “Astrosociology and the Space Community,” The Space Review, http://www.thespacereview.com/article/424/1

From a historical perspective, we currently find ourselves nearly at the dawning of the space age. Most astrosocial phenomena still occur on Earth while human space travel currently operates at low Earth orbit. As we unfortunately learned again with the Columbia tragedy, even this technology is somewhat primitive and unreliable. Even so, astrosocial phenomena produce social forces leading to social change right here on Earth. Much of the aeronautics research that currently exists produces technologies directly applicable to commercial flight and other spin-offs applicable in a multitude of areas of social life including medicine, materials processing, weather forecasting, and ever more sophisticated communications applications. Moreover, these activities influence social change in less obvious ways, requiring dedicated astrosociological investigation. While largely ignored, they remain important to society.

Apparently, many continue to overlook the following fact from both a social science and space professional perspective: both communities need one another and they will increasingly rely on one another as we move further out beyond the relative safety of Earth’s low orbit. The unknown qualities of space exploration further away from the Earth demand maximum research and understanding. They demand collaboration, not continued isolation.

Furthermore, the answer lies in the nature of space exploration today as contrasted with our efforts in the future. In time, of course, the technology will improve as we venture slowly outward to the Moon and Mars. And beyond Mars, human spaceflight will require much more robust and reliable spacecraft. Still, we will move farther and farther outward because we are culturally dedicated to exploring space. It is important to understand these cultural values. Engineers can design reliable habitats but they cannot design livable communities without assistance. Engineers and others within the space community need social scientists to help plan for the establishment of space settlements in the future, from this point forward.

### Combining the technical and social aspects of space is good –

### A. Prevents elitist takeover of space

Pass 5 – Jim Pass, Ph.D. in sociology and lecturer in sociology, August 8 2005, “Astrosociology and the Space Community,” The Space Review, http://www.thespacereview.com/article/424/1

Elites in space characterize the initial constituency of space travelers. The first people in space are the government elites and the wealthy. The average citizens of even developed nations are subject to denials of the privilege of space travel. Currently, of course, one can argue that space travel is just too dangerous. As technology develops, societies must decide how important it is to open space up to the average person. Considerations of risk exist, but so does the question of public support for something for which they cannot partake. Inclusion of non-elites as part of future space expeditions represents an ethical/justice matter, traditionally the realm of sociology. These sorts of ethical and justice matters require consideration before our technology allows for greater capabilities.

### B. Ensures the construction of social space communities

Pass 5 – Jim Pass, Ph.D. in sociology and lecturer in sociology, August 8 2005, “Astrosociology and the Space Community,” The Space Review, http://www.thespacereview.com/article/424/1

Space communities, whether they consist of elites or include average citizens, will require careful consideration as to how they are constructed. In this context, space community refers to space settlements rather than the social network of space professionals described earlier. While the space habitat’s architecture (i.e., physical environment) remains vitally important for the survival of inhabitants, construction of the social environment is no less important for their survival. And, in fact, the two types of environments must be considered together, especially when we contemplate space communities with characteristics including long duration, extreme isolation, and vast distances from Earth. Meanwhile, we must consider these realities as we construct the first space communities in closer proximity to our planet so we may learn more about what to expect subsequently in more extreme situations.

### C. Applying sociology to space solves all the reasons why space exploration is bad

Pass 5 – Jim Pass, Ph.D. in sociology and lecturer in sociology, August 8 2005, “Astrosociology and the Space Community,” The Space Review, http://www.thespacereview.com/article/424/1

Applied astrosociology has direct application to the public space program as well as to private ventures due to its direct approach in adding sociological and social scientific insights to space missions. Applied astrosociology is defined as using sociological knowledge to solve social problems related to astrosocial phenomena; that is, direct application of astrosociological research to improve astrosocial conditions. Currently, this contribution remains largely absent even as it becomes more significant to the success of ever-more complex missions planned into the future. The time to integrate astrosociology into the organizational patterns of social groups within the space community is now in order to meet greater challenges that arise. In fact, sociologists and other social/behavioral scientists should be directly involved in planning for space missions involving human and robotic spaceflight, as both comprise complementary aspects of the same program. The current concept of human factors requires expansion to include well-established traditional sociological and social science conceptualizations and research findings. Isolated space communities will need to be self-sustaining in all of their dimensions. Social problems that will inevitably occur comprise a critical concern even while the physical environment continues to operate properly. As we move forward, we must maximize our understanding of practical astrosociological issues in order to help maximize success.

### Astrosociology solves all the reasons why going into space is bad

Pass 5 – Jim Pass, Ph.D. in sociology and lecturer in sociology, August 8 2005, “Astrosociology and the Space Community,” The Space Review, http://www.thespacereview.com/article/424/1

Societies around the world continue to benefit from astrosocial phenomena even as we fail to study their effects in detail. Moreover, societies would benefit more significantly if they took advantage of the potential insights of social scientists. Knowledge regarding astrosocial phenomena, including awareness of supporting and opposing social values, makes it much easier to take advantage of existing social conditions.

When the space sciences and engineering (nearly exclusively favored by the space community) and social sciences (reflected by astrosociology) cooperate, we can move forward into the future in a way that makes us better informed, better prepared, and more capable. Astrosociology can serve to bridge these two currently isolated factions in a way that favors collaboration and greater success as we make our plans to move further outward to explore space. Independently, each community fails to attain a full understanding of the relationship between space and society. I encourage NASA, advocacy groups, and professional associations to adopt astrosociology as the formal social science arm of their organizational structures. Together, we will gain a greater understanding of issues related to space and society. With this enhanced knowledge, we can develop a more intelligent space program that benefits all Americans, and all of humanity.

## SETI Good

### SETI is good and enhances society

Pass 5 – Jim Pass, Ph.D. in sociology and lecturer in sociology, August 8 2005, “Astrosociology and the Space Community,” The Space Review, http://www.thespacereview.com/article/424/1

SETI and other astrobiological research remains an important consideration. The relationship between astrosociology and astrobiology is strong due to cultural values that favor determining if Earthlings represent the only species in the universe. Why do we pursue the search for extraterrestrial life with an uncertain likelihood of success? Values that support the search for microbial life possess consequences for actions. The question “Are we alone?” is probably nearly as old as human language itself. The answer to such a question belongs to all of humanity and not only governmental and scientific elites. Full disclosure represents an ethical concern: does anyone have the right to conceal such a discovery from the masses? Moreover, the discovery of life of any variety would produce social change among societies’ institutions and social groups. After all, social institutions, including religion, politics, and science, would need to adapt to such a development. Cultural adaptations reflect inevitable developments. We should be in position to study such potential scenarios should they unfold.

## Our Aff is Good

### The affirmatives application of the theoretical understanding of space is the only way to improve society and save lives

Pass et al 10 – Jim pass, Ph.D. in sociology and lecturer in sociology, Christopher Hearsey, ARI Director of Programs and Special Projects, Simon Caroti, Ph.D. in literature and ARI Director of Educational and Public Outreach, September 2 2010, “Refining the Definition of Astrosociology Utilizing Three Perspectives,” American Institute of Aeronautics and Astronautics, http://www.astrosociology.org/Library/PDF/Space2010\_3Perspectives.pdf

As with any scientific field, the emerging field of astrosociology must divide itself into two related parts. The theoretical half focuses on conceptualization or theoretical aspects. On the other hand, the applied half leans toward the practical application of more abstract concepts; that is, on the operationalization process. The former approach attempts to understand human behavior for its own sake. The latter approach seeks to solve concrete problems or contribute positively in some way to an existing set of conditions.

Thus, the theoretical half focuses on models of human behavior in isolated space environments. It attempts to discover laws of human behavior in isolated social settings complicated by issues added by the space ecology, or the set of relationships between human beings and their local space environment. For example, the subfield of medical astrosociology attempts to understand how biomedical issues common to space medicine affect human behavior. An illustration of this is how space-based realities such as contaminants from a planetary body or radiation from space affect humans’ health and their behavior related to subsequent reactions to these threats as well as precautionary measures taken to protect their wellbeing in the future. Theory building remains the focus. Conducting research to verify hypotheses, and then refining the theoretical models continue as part of a never-ending loop.

Knowledge gained from theoretical exercises and empirically tested requires scrutiny for its potential for practical applications.

“Thus, the definition of applied astrosociology is the application of astrosociological knowledge to astrosocial phenomena in a manner consistent with improving them for the betterment of (1) space exploration and potentially (2) other aspects of a particular society. In other words, applied astrosociology involves the use of theory and research to solve real social problems related in some way to astrosocial phenomena.”14

In a sense, then, applied astrosociology can help mitigate social problems that arise anywhere humans subsist. The applied half looks at how one could apply theoretical ideas and predictions to practical problems in various space environments. Social problems will occur in space, of course. However, astrosociological research can assist in mitigating social problems on Earth. Many may overlook or disparage this reality, but bringing space to Earth in more and more in meaningful ways seems the pattern of the future, especially as Earth-based nonrenewable resources continue to dwindle or else become contaminated.

Applied astrosociology must exist as an important part of astrosociology’s definition because conceptualizations alone fail to improve the human condition on Earth or in space. Applications of theoretical principles will prove especially indispensable in space environments due to their unforgiving natures and the rigors of living and working in these isolated conditions. In space especially, this could mean a matter of life or death. Ongoing astrosociological research must continue, and quick successful adaptations to new or evolving threats must remain viable options. Theory building by itself will never result in practical solutions. Applied astrosociology represents a separate, but essential, facet that complements the theoretical side.

## Exploration Good – Peace

[Abstract] The authors report on the concepts and issues underpinning what they term space-based information transfer systems (SBITS), that seek to connect global audiences through web interfaces with realtime images of lunar landscapes, video and displays monitoring a variety of astronaut activity from within the International Space Station, and other such schemes. The underlying assumption with such efforts is: If personal computer technology and applications have been commercializable, then their infrastructure and processes applied to space will be commercializable. However, many obstacles have emerged regarding the funding of such schemes, the actual scope of the technological infrastructure required to mount the systems, questions about intrusion on astronaut crews’ privacy, confidentiality, personal space, and workload. Regardless of their current “doability” status, these schemes are a convergence of various sub-taxonomies of space: cyberspace, outer space, personal space, public space, and cultural space.

This report takes the astrosociological approach in examining the key issues concerning SBITS schemes. If resources were to emerge and the technology were to develop to enact SBITS schemes, spin-off benefits of casual outer space information transfer on Earth may have considerable social impact. Web link infrastructures aboard or near the International Space Station, or even further afield, could serve as interactive nexuses between astronauts and a diversity of persons on the Earth. The authors discuss a range of issues, including: Once a system is mounted and begins to be used, what methods might be employed to gauge the results of the usage of these systems? Since SBITS schemes are about sharing and distributing the human experience of space through a two-way – or perhaps multiple-way -- feedback system, it may positively impact the experience of life on Earth and serve to improve the vigor and sustainability of the space endeavor.

**Keywords:** space-based information transfer systems (SBITS), microsatellites, nanosatellites, robotics, planetary consciousness, planetary situation awareness, 1International Space Station, sustainability

I. Introduction – The Authors’ History of Ideas

WHAT a scientific adventure it was for author Dudley-Flores to ask for near real-time satellite imagery and get it for her studies of Arctic coastal processes, ice morphology, and palaeostream channeling! As a researcher at the University of Alaska’s Geophysical Institute in Fairbanks, she had access to Landsat Multispectral Scanner (MSS) Quick-Look services. She was able to view planetary phenomena in the color infrared from the perspective of an orbital altitude of 917 km. The Landsats were supplanted through the 1990s by other more capable space imaging platforms, and Dudley-Flores left the planetary sciences to pursue the social sciences. And, in considering social problems, large and small, that often connect to aspects of the physical environment, she wondered if solutions could be more readily discerned if more of a global audience could view the Earth from the vantage point of space. But, access to space-based systems, until the advent of the Internet, were largely reserved for those who could connect to scientific facilities. And, then, one might be hampered in what one was looking for because so much satellite imagery is classified and not available to ordinary civilian researchers. That situation still obtains in our current “Google Earth” era.

With the maturity of the Internet, enterprising and creative computer applications entrepreneurs began to consider the issue of how to merge outer space production with cyberspace production, which would, by necessity, require a synthesis of the Internet and space-based platforms. The latter would include platforms that might not be regarded traditionally as satellites. Observing this, the authors were quite excited by this development. Might these entrepreneurs, some who had made tidy fortunes in pioneering Internet industries, become force multipliers of the space endeavor? One of the more successful has been SpaceDev, headquartered in Poway, California, that became more action than talk when it built and operated the Low Earth Orbit (LEO) microsatellite, the Cosmic Hot Interstellar Plasma Spectrometer (CHIPSat) in January 2003. CHIPSat is the first American satellite to use TCP/IP‡ for end-to-end satellite operations control. The satellite was built for the University of California-Berkeley under NASA’s University Explorer Program (UNEX).§ SpaceDev’s founder, James. W. Benson, who entered the aerospace contractor industry from the computer applications industry, is now involved with the issue of developing space tourism and civilian spaceships. However, not long after the founding of SpaceDev, Benson had been interested in a space-based information transfer system (SBITS) scheme that would allow Internet users to view real-time landscapes from lunar orbit and later view real-time terrain from cameras mounted on lunar rovers (1999).\*\* Interested in the challenges that SpaceDev found in developing this project, the authors and several colleagues made a pitch to Dentsu Corporation of Japan over 1999-2000 (2000).1 Interestingly, in 2001, Dentsu shot Japan’s first space commercial aboard the International Space Station (ISS) in the Russian module using a highdefinition television camera and tapes provided by the National Space Development Agency (NASDA)††. After that, we heard no more about Dentsu’s interest in the lunar webserver project. No “Thank you, for letting us review your proposal.” Nothing.

With the development of AERCam‡‡ (Fig. 1) and Mini AERCam robotics from the mid-to-late 1990s, other technological opportunities emerged. Developed under NASA’s Johnson Space Center Directorate, AERCam technology is characterized as a free-flying robotic inspection vehicle. Its “Mini” version is also classed as a nanosatellite. Weighing in at 10 lb and with a 7.5-inch diameter, NASA’s factory specs on the smaller version of the flight-tested article are as follows below.§§

By 2004, European entrepreneurs began conceptualizing about space-based links to the Internet to communicate video and other types of electronic monitoring of astronauts aboard the ISS. Dudley-Flores, who was familiar with the Mini AERCam from participation in the American Institute of Aeronautics and Astronautics, determined that the European platforms could benefit by using Mini AERCam robotics. However, when author Dudley-Flores and fellow American aerospace architect colleague, Constance Adams, made inquiries, it was clear that European conceptualizers did not understand the capacities and limitations of the platform (2005).\*\*\* Shortly thereafter, author Jun Okushi was brought into the discussion. Through these discussions, we pondered the “what ifs.” What if engineers and designers could ramp up the capacities of Mini AERCam robotic nanosatellites and post them in and around the ISS? What if the platform could be linked to a network of satellites that would connect the feed from the Mini AERCams to the Internet user? If this were doable, then some interesting possibilities, as well as research opportunities, would emerge. Because of the possibilities, the design process would, by necessity, have to deploy human and social factors engineering and a state-of-the-art communications system for interfacing with diverse cultural others on Earth.

Would communicating the experience of astronauts aboard the ISS transcend cultural, technological and interdisciplinary divisions on Earth? Would a multi-modal communications system inspire a new human cognition by enabling comprehensive human perceptions of space, humanity’s places within it, and cultural identities in relation to one another by offering a diversity of human percipients’ intimate experiences from the Cosmos-based vantage point? After all, astronauts have returned from space missions claiming to have been changed from their unique vantage point of being “up there.”

Space exploration is necessary for planetary consciousness – seeing the world from space makes us realize the fragility of the earth. This planetary consciousness creates a better global citizen and makes us comprehend the interconnectedness of the world

Okushi and Dudley-Flores 07 - Jun Okushi – Director, Japanese Operations, OPS-Alaska and Program Head, Space Projects Group/Okushi Architects and Marilyn Dudley-Flores - CEO and Chief Research Scientist, OPS-Alaska – both are member of American Institute of Astronautics and Aeronautics, Sept 18-20 2007, “Space and Perceptions of Space in Spacecraft: An Astrosociological Perspective,” <http://www.astrosociology.com/Library/PDF/Contributions/Space%202007%20Articles/Space%20and%20Perceptions.pdf>

The significance of this vantage point cannot be understated. In 1950, astronomer Sir Fred Hoyle wrote the following prediction for a BBC radio broadcast, “Once a photograph of the Earth, taken from outside is available – once the sheer isolation of the Earth becomes known – a new idea as powerful as any in history will be let loose.”2 That photograph was the one that became known as “Earthrise” (see Fig. 2). Another of the most famous images returned from space was one labeled “African Continent, Blue Marble (see Fig. 3). Albert Gore used both of these images in his feature-length documentary, *An Inconvenient Truth,* to **demonstrate both the fragility of the Earth and the interconnectedness of things in the world in the face of global warming.**

In 1971, on the Moon and on the way back, Astronaut Edgar Mitchell experienced an incredible alteration in human perspective that he describes as “life-changing” in his book *The Way of the Explorer*.3 Out of the window of the *Apollo 14* Command Module, he contemplated his: blue jewel-like home planet suspended in the velvety blackness from which we had come. What I saw out the window was all I had ever known, all I have ever loved and hated, longed for, all that I once thought had ever been and ever would be. It was there suspended in the cosmos on that fragile little sphere. I experienced a grand epiphany accompanied by exhilaration, an event I would later refer to in terms that could not be more foreign to my upbringing in West Texas and later, New Mexico. From that moment on, my life was irrevocably altered.

Thomas Gangale has written that the most important thing we discovered on the Moon was a part of ourselves “In the few hours that a few of us spent on the Moon from 1969 to 1972, we became better earthlings. As the poet Archibald MacLeish wrote, we were ‘riders on the Earth together.’ We realized that we were our brother’s keeper, and we remembered God had appointed us stewards of the Earth (2005, p. 127).”4 Author Frank White discussed at length this type of epiphanic experience in space and from imagery from space in his book, *The Overview Effect: Space Exploration and Human* Evolution. 5 White described this phenomenon as: A complex and profound meta-experience that astronauts and cosmonauts have reported that runs the gamut from a type of spiritual experience to a realization that we humans, as separated as we are by all manner of boundaries, are, in the final analysis, the progeny of one precious world with a thin veneer of atmosphere.

This unique perspective is shared by just over 400 human beings. As such, a problem currently exists. The global public has never seen “the big picture.”

III. The Problem of Planetary Consciousness and Potential Solutions

The average human being has not experienced the view from space on a personal basis, although these pictures from space have been around for upwards to 40 years. Subsequent years have brought more space missions, both human and robotic, with fabulous imagery. Robotically, we have stood on the ground on Mars, we have seen up close mighty impacts on Jupiter, the rings of Saturn, and towering dune fields on Titan. We have even seen the great columns of hydrogen clouds spanning light years that are the incubation places of stars and looked back in time toward the very birth of the Cosmos. Why haven’t the peoples of the Earth been subsumed by this overwhelming experience of viewing things in space and the world from the space? Why haven’t they beaten their swords into plow shares, held hands and sang Kum Bah Yah, and turned their attention to turning the tide against global warming, a fairly immediate threat as time is kept over generations that can kill more people than all of the wars of the Earth put together?
A. Searching for Answers

A clue to this enigma lies in a prediction that failed to come true that was made by Sir Arthur C. Clarke in his novel *2061: Odyssey 3* (1987, p. 4).6 In the story, the Earth had become relatively peaceful once everyone had access to free long-distance telephone calling service. With the Internet and the quality of communications technology today, we *can* make free long-distance telephone calls. At least those of us who can access, can operate, and can afford the technology can make those calls. One can be in London and make a phone call to someone in Peshawar and the other party sounds like he is speaking from the next room. But, there are still wars, India and Pakistan might yet fight a limited nuclear exchange, and the large part of Earth’s population hasn’t yet caught on to the impending devastation of global warming. What is the problem? The answer to that has to do with the inadequacy of the delivery systems of these images from space and to the fact that studies of how humans comprehend spatial and other types of relationships on the ground, in space, and across cultures are still in the infancy of synthesis and application.††† Lack of political will is another problem. In *An Inconvenient Truth,* both the documentary and the book,7 Albert Gore also spoke of the “backburner” attitude that his American congressional colleagues demonstrated when he gave them slide shows about global warming. The problems on the radar screens of congressional constituents were more immediate so their representatives did not move to act to hammer out legislation to help offset the more overwhelming planetary issue. Sitting in the gravity well of the Earth, with some people being able to see pretty pictures from space, and with some people being able to talk to other people cheaply at a distance still hasn’t communicated the *gravity* of our situation. The planetary situation awareness of the average person is poor. It isn’t very real to most people that Earth is a planet in space, that it is in danger from global warming, and that seeing it from space helps us assess the condition of the planet and provides us with direction how to keep it livable.

A science fiction story by Ray Bradbury provides a clue to the solution. “The Rocket” tells the story of Fiorello Bodoni, a poor junk dealer, who uses his family’s savings to build a replica rocket from an old mock-up and outfits it with virtual reality simulations to provide his children with the trip of a lifetime.8 To communicate the isolation of the Earth in space, to emphasize our interconnectivity on this one world, and to impart to any human being his/her planetary situation awareness just in the way that an astronaut knows it requires that a diversity of people must be able to connect in an intimate way to the reality of the Earth as a planet in space.

Alas, we do not yet have the capacity to cheaply offer rides into space for millions of people to experience this reality. But, we do have the technology and knowledge to make the experience as *numinously* real as possible and to distribute it across a diversity of cultures in ways that it will be understood. The notion of numinosity comes from Rudolf Otto’s book *The Idea of the Holy: An Inquiry Into the Non-Rational Factor in the Idea of the Divine and Its Relation to the Rational* (1923).9 ‡‡‡ Numinosity seems to be related to the experience that many astronauts describe.

Let us suppose that our research question was “Why don’t people have better planetary situation awareness?” Then, a hypothesis we might generate from that question would be: If every person on the planet could see the Earth from space and experience being in space, then each person could develop a planetary consciousness. In other words, if a diversity of people could experience the space experience as realistically as possible, then they would demonstrate heightened situation awareness. This situation awareness over time could then be measured by various indicators that would demonstrate a trend toward good global citizenship, social investment in people, and outward and future-looking optimistic views vs. nationalist agendas, unbounded profit-making at the expense of people and the planet, and a decrease in inward, past- and present-looking fatalistic views. Some indicators would be things like increased demands for laws to protect the environment, for better disaster preparedness on the parts of local, regional, and national governments, for educational programs pitched toward mitigating the planetary global space and the future of humanity. This leads to the enunciation of a related hypothesis: Constructive holistic thought processes and actions can potentially become physically manifest on an individual, collective, and global scale if technology, human intelligence, and international cooperation are harnessed effectively cross-culturally and across disciplines.

Best way to solve planetary consciousness

 Okushi and Dudley-Flores 07 - Jun Okushi – Director, Japanese Operations, OPS-Alaska and Program Head, Space Projects Group/Okushi Architects and Marilyn Dudley-Flores - CEO and Chief Research Scientist, OPS-Alaska – both are member of American Institute of Astronautics and Aeronautics, Sept 18-20 2007, “Space and Perceptions of Space in Spacecraft: An Astrosociological Perspective,” <http://www.astrosociology.com/Library/PDF/Contributions/Space%202007%20Articles/Space%20and%20Perceptions.pdf>

B. The Future of Space-Based Information Transfer Systems

Can space-based information transfer systems (SBITS) develop in an ever-increasingly Internet-connected global audience a planetary consciousness? The authors think that it is likely. In terms of reaching large volumes of people, permutations of web-based SBITS encounters and virtual reality-actual imagery, audio, and other feed combinations have a better chance of instilling such a global group state within the next several years than the tiny growing cadre of space tourists and entrepreneur-astronauts in the same period of time. As Thomas Gangale has pointed out, in disabusing the computer applications technologist’s space development expectations with astronautical fact, “…there is no astronautical analogue to Moore’s Law (Dudley-Flores and Gangale 2007).”10 NASA appears to have recently come to understand the utility of a virtual reality-actual feed combination. The head of NASA-Ames Research Center, Simon “Pete” Worden, has partnered with Silicon Valley talent to produce an online 3-D virtual world called “Second Life.” The game allows Internet-connected participants to create avatars of themselves in the virtual world. Worden told an audience at the National Space Society meeting in Dallas, Texas in May 2007 that “Real data from real missions such as the International Space Station can be ported into virtual environments.” Worden described that by matching the attributes of cyberspace with small, inexpensive space probes using micro-satellite technologies, a new world of space exploration was feasible. He told his NSS audience that when the next people step on the Moon and expand into and settle the solar system that all could go along through their avatars in such games. “The revolution in nanotechnology means we can do pretty surprising things in very small packages,” Worden said.§§§

It is a matter of time before these technologies mature, some faster than others, and a web-based system will distribute through diverse user interfaces across cultures the experience of space on Earth. This may be accomplished through games, mobile technologies and architecture, and educational interfaces. As these users view their Earth from space and become aware of their situation, the authors think it likely that they will want to address our most pressing contemporary global issues. These components can be expected to feed into a generative learning system that may impact the diversity of cultures and our well-being in toto as a planetary society that has crossed the threshold into a suite of overwhelming challenges.

IV. The Obstacles to Planetary Consciousness and the Astrosociology Connection

The issues related to functional and effective space-based information transfer systems (SBITS) involve social scientific concepts applied on a scale grander than merely the societal level. As astrosociology develops as the unifying single perspective in the social sciences to investigate space issues as they relate to humanity, this area of research and development may well become a major specialty area within the field. The significance of a planetary consciousness, a planetary situation awareness, from god-views of our home planet, of the Moon, and from “like being there” methods, is that we may expect them to improve the human condition.

However, there are many obstacles for SBITS systems and would-be users. Some are listed below.

􀂃 Availability of the technological infrastructure required for mounting the systems for a global audience

􀂃 Intrusions on astronaut crews’ privacy, confidentiality, personal space, and workload

􀂃 Social, cultural, religious, and political barriers to user interfaces\*\*\*\*

􀂃 A lack of (or lack of interest in) a unifying stock of knowledge about the linkages among the sub-taxonomies of space: cyberspace, outer space, personal space, public space, and cultural space††††

Astrosociologists are positioning themselves to study these obstacles and to report on their status as new projects and programs come online.

V. Conclusion

Establishment of a planetary situation awareness, which is what we mean by “planetary consciousness” in this report, may doubtless prove difficult to achieve due to the many obstacles outlined above and those we have not yet reckoned. We can witness the fact that all of the space missions of the past have inspired many people on a particular level, but such a level of inspiration is much less profound for ordinary people than the space elites (e.g., astronauts and cosmonauts) who actually experienced what it was like “up there.”

Author Frank White has mentioned on the radio that he would like to allow more human beings to experience the “Overview Effect” by creating realistic simulations of space travel that go beyond the visual to include the other senses and perhaps create the feeling of isolation as sensed by space travelers. And, if the ordinary individual in Canada, in Italy, in Mozambique, in the Seychelles, in Tajikistan, in Mongolia, in Papua-New Guinea, and in California or any other locale, in his or her space-like isolation, can look out the window to apprehend the Earth, there will likely swell within his or her heart new feelings and new realizations. Such is a paradigm shift, born of humanity abroad in the Cosmos, even if bound to the Earth. This shift can be expected to more tightly integrate humans, their machines, and the experiences of all those on Mother Earth. By engaging the challenges of abyssal distances, the humans of the whole Earth can develop a sense of kinship, that “we are in this together,” a perception never fully developed to date by the global population in its history. And, hopefully, one that will be coming soon.

Space exploration reduced the cultural divisions – everyone shares the responsibility to preserve it. Exploration also creates peace for future generations

Reibaldi 94 - Giuseppe G. Reibaldi - Professor of Space Policy at the Aerospace School of the University ‘La Sapienza’ Rome, Oct 5 1994, “CONTRIBUTION OF SPACE ACTIVITIES TO PEACE,” <http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6V1N-3YMWKKB-7-1&_cdi=5679&_user=1458830&_pii=009457659400292T&_origin=&_coverDate=04%2F30%2F1995&_sk=999649991&view=c&wchp=dGLzVlb-zSkWA&_valck=1&md5=d9b43e1892e4fce1a229ac8a1d40cffb&ie=/sdarticle.pdf>

The Earth’s fragility in the darkness of space has been a powerful experience, not only for the astro- nauts themselves, but also for the rest of the public’s opinion. This vision has stimulated the sense of belonging to the same planet without any division and the need of sharing the responsibility to preserve it, since it is the only one that we have. This is what is called the “Overview Effect” [ 121. This effect should be at the basis of a new planetary social contract that should overcome all differences existing between the different regimes on Earth for the good of mankind. The planetary social contract would be a logical extension, to the Earth’s dimension, of the original Locke’s social contract which was aiming to derive civil society from the consent of its member. This educational and ethical element derived by space activities, will be important for the spread of peace since it could be a base on which new generations could grow and overcome their differences. Planning for space activities common to all mankind will stimulate further friendship between all the countries on Earth as well as being a major cultural challenge. This will contribute to spread peace, as Bertrand Russell said: “If the world is ever to have peace, it must find ways of combining peace with the possi- bility of adventures that are not destructive”[l3].

Space activities create cooperation that works to ease cultural divisions and create peace

Reibaldi 94 - Giuseppe G. Reibaldi - Professor of Space Policy at the Aerospace School of the University ‘La Sapienza’ Rome, Oct 5 1994, “CONTRIBUTION OF SPACE ACTIVITIES TO PEACE,” <http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6V1N-3YMWKKB-7-1&_cdi=5679&_user=1458830&_pii=009457659400292T&_origin=&_coverDate=04%2F30%2F1995&_sk=999649991&view=c&wchp=dGLzVlb-zSkWA&_valck=1&md5=d9b43e1892e4fce1a229ac8a1d40cffb&ie=/sdarticle.pdf>

Looking at the future, a new hypothesis[lO] has been made about potential sources of conflicts which is no longer linked to ideological or economical reasons, but merely to a group of different civiliz- ations. According to this study the clash of civiliz- ations will dominate global politics. The fault lines between civilizations will be the battle lines of the future. Civilizations stand for the highest cultural grouping of people, e.g. Islam, Western Euro- American and the Confucian civilizations. At the base of potential conflicts lies the intolerance of each other’s ideas, as well as the confidence of being the source of the ultimate truth. If we consider the Islamic world, in particular, it seems that some steps could be taken to reduce the gap with the West and consequently to reduce the risk of conflicts, i.e. trying to harmonize cultures and the way of living.

Space activities can play an important role in trying to harmonize the diversity of cultures. The intro- duction of space activities in Islamic countries, for instance, would bring the highest symbol of modern- ization, without touching the religious sphere and would help to promote the principles of democracy as well as the right of self determination. Finally, in the long run, the participation of these countries to common space programmes will make them share common objectives and make them part of the same human race, regardless of any religion.

Japan is a good example of a country which has been able to balance the projection towards the future and yet keep its cultural roots intact, implementing all the measures indicated above

In 1990, the German astronomers Freimut Börngen and Lutz Schmadel named an asteroid after one of the foremost political philosophers of the twentieth century, the German Jewish émigré Hannah Arendt.[1](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn1) Whether Arendt would have appreciated the gesture is uncertain.[2](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn2) After all, she opened her philosophical masterpiece *The Human Condition* (1958) by voicing grave concerns about a second satellite—*Sputnik*. In 1957, man had for the first time propelled his artifacts into the beyond, and he was likely to follow by propelling himself as well. But to desire to depart from the scene of the world, she felt, meant also to think of the world as something worth leaving. To emancipate ourselves from its physical limits—gravity—meant also to emancipate ourselves from the gravity of its existential claims upon us. *Sputnik* therefore embodied an impulse already much in evidence on Earth—to create an artificial planet. In*Sputnik* the ambitions of modern man lay revealed.[3](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn3)

These ambitions were ominous. They had also in part been realized. *The Human Condition* appeared not long after Arendt's famous study *The Origins of Totalitarianism* (1951), and she advanced through *Sputnik* some of the themes broached in that earlier effort. Totalitarianism, it turns out, shared something important with the Russian satellite. *Sputnik* embodied a desire to fabricate an artificial substitute for the living Earth. Totalitarianism, in turn, distinguished itself from every other form of rule in its ambition to create a new world fit to compete with this one, the non‐totalitarian world, and its success was to be measured in the consistency of its artful fiction. Totalitarian regimes create an “artificially fabricated insanity,” and “their art consists in using and at the same time transcending the elements of reality.”[4](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn4) Totalitarianism's artful fiction, however, had its all too real apotheosis in the concentration camp universe, a realm inhabited by a population of twilight creatures that Arendt called “the living dead.” In her view, we did not need to depart from the surface of the Earth to create a death star. Western civilization had already managed it, right here.

All of this is curious. Only the morally maladroit would think to compare the death camps with a metal ball called “Companion.” Notwithstanding the Cold War context in which it was launched or the shock it unleashed, *Sputnik* was for some just a harmless*piepende Kunstmond*, as the German philosopher Hans Blumenberg described it.[5](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn5) It was a beeping, diminutive moon‐manqué, a stimulus to reflection, but hardly to panic. Nonetheless, Arendt appealed to the same vocabulary to make sense of them both. For all their differences, *Sputnik* and totalitarianism, modern science and modern politics shared a common pathology. Each testified to the modern displacement of the grown by the made, of living organisms by technical artifacts.

Arendt's approach was idiosyncratic. Her concern was not. Anxiety about the triumph of the made over the grown was shared by a slew of twentieth‐century figures across virtually every domain of thought and culture, and it has hardly abated since. It is the subtext for a host of pressing concerns, including the anthropogenic origins of global warming, the engineering of transgenic organisms, the industrialization of agriculture, and the question of legal standing for natural objects.[6](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn6) The field of environmental history is rooted in this anxiety, and it is a key issue in other fields as well. Historians of urbanism and the city, of industry, of regimes of labor (such as Taylorism or Fordism), of fashion and craft, of technology—in sum, anyone concerned with the history of what it has meant to make in the modern era—implicitly reflects on the issue. This holds for the making not only of things, but also of selves and of worlds. Blumenberg exaggerated when he declared the question of organism and artifact the theme of modern intellectual history—but perhaps not by all that much.[7](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn7)

To best grasp the importance of this theme, consider Earth, on some counts the largest organism of them all. Arendt and other mid‐century intellectuals concocted powerful ideas about the transformation of the Earth into a man‐made planet, ideas that crystallized in reflections on what it means when we look back upon Earth from beyond. In 1966, for example, Arendt's teacher Martin Heidegger, perhaps the most consequential philosopher of the twentieth century, spoke with consternation about photographs of the planet shot from space. “This is no longer the earth on which man lives,” he complained.[8](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn8) Blumenberg worked in the same influential tradition of thinking about technology and modernity that animated Heidegger and Arendt. Indeed, he may well have been that tradition's most superlative interpreter and historian.[9](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn9) But in 1975, Blumenberg decisively reversed their claims and declared their anxieties misplaced. He expected that the view of Earth from beyond would re‐vindicate Earth—and the modern project itself—albeit by radicalizing the Copernican revolution that had undermined Earth's centrality in the first place.[10](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn10) Within the span of a decade, something had changed—evident both in philosophical reflection and in Western culture writ large. The “Earthrise era” had begun. In some ways, it is also our own.

Viewing the Earth from space created an interconnected world – gave rise to terms like global humanity and global environment

Lazier 11 – Benjamin Lazier - Associate Professor of History and Humanities at Reed College, author of *God Interrupted: Heresy and the European Imagination between the World Wars*, June 2011, “Earthrise; or, The Globalization of the World Picture,” <http://www.jstor.org/stable/10.1086/ahr.116.3.602>

Broadly speaking, the Earthrise era comprises several important developments. The first is the rise of an “Earthly vision,” or a pictorial imagination characterized by views of the Earth as a whole. Hear the word “Earth,” and the images likely to flash through the mind are descendants of two views afforded by the Apollo missions. One shows the Earth half‐cloaked in shadow as it floats over a lifeless moonscape. It arrived on Christmas 1968 and is called “Earthrise”: hence, the “Earthrise era.” (See [Figure 1](http://www.jstor.org/action/showPopup?citid=citart1&id=fg1&doi=10.1086%2Fahr.116.3.602).) A second photograph, from December 1972, shows the disk of our terraqueous planet suspended in the void. It is officially titled “Blue Marble” and is reputed to be the most widely disseminated photograph in human history. (See [Figure 2](http://www.jstor.org/action/showPopup?citid=citart1&id=fg2&doi=10.1086%2Fahr.116.3.602).) Its “frameless” frame—the void—has left it especially open to appropriation. These two images and their progeny now grace T‐shirts and tote bags, cartoons and coffee cups, stamps commemorating Earth Day and posters feting the exploits of suicide bombers. In other words, this pictorial imagination is not simply that. As a stand‐in for the idea of the Whole Earth itself, it has acquired an iconic power that helps organize a myriad of political, moral, scientific, and commercial imaginations as well.[11](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn11)

Views of Earth are now so ubiquitous as to go unremarked. But this makes them all the more important, and their effects historically novel. Our ideas and intuitions about inhabiting the world are now mediated through images that displace local, earthbound horizons with “horizons” that are planetary in scope—the distinction between earth and sky surmounted by that between Earth and void. These intuitions have dovetailed with new habits of speech, a vocabulary—and a second key development of the Earthrise era. But there is something peculiar about this vocabulary. It is just as “global” as “Earthly,” if not more so, and it is peculiar because the Earth as seen from space is often perceived as the natural or organic antithesis of an artifactual globe. Still, there is no avoiding the fact that as common expressions, the word “globalization” and the phrases “global environment,” “global economy,” and “global humanity” simply did not exist before the Earthrise era, and this explosion of globe talk is part and parcel of changes in the Western pictorial imagination that at first glance seem unsuited to it.[12](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn12)

To make sense of these developments—the combination of Earthly vision with global vocabulary—we might think of the Earthrise era as a stage in a longer history, a “globalization of the world picture.” “World picture” is the English equivalent of Weltbild, a philosophical term of art coined by Wilhelm Dilthey but now associated with Martin Heidegger. Heidegger did not use it to refer literally to images of the planet. Rather, he meant that the ways we comport ourselves vis‐à‐vis our natural and human‐built worlds are pre‐structured by a grasp of the world and everything in it as a picture, as something to survey and frame for our pleasure and use. Consider in this context the words of Apollo 8 astronaut Frank Borman: “Look at that picture over there!” The first human to lay eyes on an Earthrise made intuitive appeal to a language that is the staple of tourists everywhere—to describe not the sight itself, but the conditions in which the sight could first be disclosed or come into view, its frame. It may be the most definitive confirmation possible of Heidegger's claim, made thirty years before, that “the fundamental event of the modern age is the conquest of the world as picture.”[13](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn13)Thinkers in the phenomenological tradition, which attends to pre‐cognitive ways of being in the world, help us see that this was no failure of imagination on Borman's part. His remark voiced something more like the condition for modern human experience in the first place—and if Heidegger was right, our condition in this alleged age of the world picture.[14](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn14)

So we are left with several questions about the Earthrise era: the scope of its vision, the peculiarity of its vocabulary, and the changes it inaugurated in the conditions for human experience, or what some philosophers call the “human condition.” To address these questions, it helps, first, to situate the reactions of these philosophers to the view of Earth from space alongside those of their non‐philosophical contemporaries, on the premise that philosophers and Grub Street pamphleteers alike reflect on the shared events of the day. They do so, of course, with different vocabularies, and at times philosophical discourse can come off as alien indeed. This is a difference to acknowledge. It is also a difference for historians to exploit. Arendt and company wrote with enormous depth, and so it can help, second, to think *with* them, on the premise that philosophers have something to say even to those of us who do not answer to the name. At the very least, they provide us with a repository of conceptual tools with which to reassess the era of which they were themselves a part.

This approach is openly eclectic. It swings between the registers of intellectual history, cultural history, environmental history, and the history of science. It also affords returns, above all in new kinds of stories about the Earthrise era. For example, we typically include the “Earthrise” photograph in a congratulatory story about the rise of environmentalism. There is something to this. Like globe talk, the language of environmentalism is an invention of the Earthrise era.[15](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn15) But there is a more sober and wide‐ranging story to be told. The examples of Heidegger, Arendt, and Blumenberg help us see how the history of the Whole Earth icon is part of a history of competing globalisms, and still more of technologically complicit ones—commercial and environmental globalisms above all. Their example therefore prompts us to ask whether the visions and vocabularies of the Earthrise era have inadvertently accelerated our planetary emergency as much as they have inspired us to slow it down. They also help reveal the structural tensions between organism and artifact at the core of canonical environmental texts of the Earthrise era (such as Stewart Brand's *Whole Earth Catalog* and James Lovelock's *Gaia*) that destabilize the concept of a “global environment” itself.

If this approach supplements traditional contexts (the Cold War, environmentalism) with new ones (the history of organisms and artifacts in the modern era), it also calls attention to categories often excluded from historical consideration in the first place, by subjecting to historical analysis what philosophers such as Arendt call the human condition or, in a different key, what Heidegger means by world picture. Here is where the expression “globalization of the world picture” can help. It opens Heidegger's totalizing view of the modern age to the swerve of historicity, so that we might speak of reversals, ruptures, and heterogeneous eras—an Earthrise era, for example, or a post‐Earthrise condition in which the view of the whole Earth exerts its most subtle and wide‐ranging effects precisely when its novelty fades. Stated a bit differently, the expression illuminates the historical predicament in the injunction to “Think globally, act locally!” The first half of this phrase is not so much a moral directive, which we may or may not opt to follow, as it is one description of the human condition in the Earthrise era. There now holds sway a world picture in which the condition of “earthliness” is conjured by way of a view from the most unearthly of places—the void; in which the horizons of earthbound experience compete with horizons that are planetary, or capital‐E Earthly, in scope; and in which the vision of the naked Earth is also the view of a globe in disguise, the greatest of organisms: a man‐made planet. Thinking globally is probably now less our choice than our lot. A history of the Earthrise era can help us understand what this means and how it came to be.

In September 1966, Martin Heidegger agreed to an interview with the leading news magazine *Der Spiegel*. Ostensibly, the aim was to explain his collusion with the Nazi regime. The appeal of National Socialism, Heidegger had remarked in a 1935 lecture, had little to do with the justifications offered by most of its sympathizers. In parentheses, he added that “the inner truth and greatness” of the movement inhered instead in its willingness to confront a singular crisis: “the encounter between global technology and contemporary man.”[16](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn16) This crisis had abated not at all in the postwar years, he now explained. If anything, the achievements of the postwar welfare state testified still more to its currency:

Everything is functioning. This is exactly what is so uncanny, that everything is functioning and that the functioning drives us more and more to even further functioning, and that technology tears men loose from the earth and uproots them. I do not know whether you were frightened, but I at any rate was frightened when I saw pictures coming from the moon to the earth. We don't need any atom bomb. The uprooting of man has already taken place. The only thing we have left is purely technological relationships. This is no longer the earth on which man lives.[17](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn17)

A great deal of ink has been spilled over the meaning of Heidegger's remarks. Was Nazism great because it faced up to the problem of technology or because it was that problem's greatest exemplification or symptom?[18](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn18) Usually overlooked in the brouhaha, however, is the phrase translated as “global technology.” The German original, *planetarisch bestimmten Technik*, has a different point of emphasis. More literally, it means “planetarily determined technics.” The translation suggests a concern with technology circumstantially endowed with a global reach, the German with the “planetary” itself. In the translation, the globalism of technology is a historical accident or effect; in the original, it is just as much a cause. The implication: modern technology, wherever it happens locally to be deployed, already presupposes a global or planetary scope. Phenomenologically—at least in the modern era—the planetary comes first.

Why would Heidegger react with such ill feeling? In part, the answer is prosaic. In 1966, Heidegger was not privy to the totemic shots of “Earthrise” and “Blue Marble.” Indeed, it is easy to see how the photos he did have at his disposal (from *Lunar Orbiter 1*) might have been frightening in the extreme. (See [Figure 3](http://www.jstor.org/action/showPopup?citid=citart1&id=fg3&doi=10.1086%2Fahr.116.3.602).) They are stark and austere. They are also vertiginous in a way that the iconic “Earthrise” is not. They confound one of the presuppositions of phenomenological analysis, that the body has a customary orientation in space: up and down, front and back, above and below, before and behind.[19](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn19)

The reflections of Heidegger's teacher Edmund Husserl attest to the importance of this point. Husserl, the founder of the phenomenological movement, did not live to see photographs of the Earth from space. He did, however, consider the possibility in a thought experiment broached in an unpublished essay left behind in his papers. Its title, “Foundational Investigations of the Phenomenological Origin of the Spatiality of Nature,” is a bit misleading. A note scrawled on the envelope in which the manuscript was discovered revealed his true aim: “*Overthrow of the Copernican theory* in the usual interpretation of a world view.” Why on earth would Husserl have wished to contest the Copernican turn? Why on earth: that, precisely, was the problem. Taken to its logical conclusion, he feared, the Copernican theory dislodged man from his earthly horizon. Notwithstanding our post‐Copernican knowledge that the Earth revolves around the sun, Husserl insisted that our everyday experience is pre‐Copernican through and through. This held as much for ancient cave dwellers as for his students at the university in Freiburg. Or as he had written on his envelope, “The original ark [*archē*], earth, does not move.”[20](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn20)

Husserl therefore recommended that we recall an experience Copernicanism had suppressed: nature as it is intuitively felt and lived. Heidegger would consider something of the same. He would ask after the prospect of retreating from “mathematical formalism” in favor of an “immediate return to intuitively given nature” (if never wholly to embrace it). He would look with disfavor on the tendency of modern astronomical science to make obsolete the distinction between earthly and celestial bodies by reducing all natural bodies to specimens of a single kind. He would dispute the exclusive truth claims made by post‐Copernican science: “Galileo,” he once wrote, “is not more true than Aristotle.”[21](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn21) He too would insist that the planet as such could not be the proper scene for human being.

Or at least not the kind he had in mind. The planet was simply too big. Heidegger's word for human being, *Dasein*, means being‐there. It presumes local, situated, and finite, not global or planetary, horizons. To enter into a relation with something of such size therefore demands a form of management and radical reduction, and a mode of being‐human especially suited to the process: hence his talk in a later essay of the “planetary imperialism” of “technologically organized man.”[22](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn22) The rise of the planetary in the modern imagination was synonymous for Heidegger with the demise of the earthly and the worldly, and these images from space only consolidated a process—a globalization of the world picture—already long in the making.

In some respects, it is easy to see why. Take, for example, an important early lecture (November 13, 1935) that Heidegger delivered on the origins of the work of art. There he spoke at length about the categories of “earth” and “world.” Worldliness had been a prominent Heideggerian theme for some time, addressed (albeit differently) in his 1927 masterpiece *Being and Time*. In this lecture, however, he explored its relation to a new category in his vocabulary—earth. Here is how he defined it: earth is “that whence the arising brings back and shelters everything that arises as such.” Earth is a “sheltering agent,” he explained, for those things that “arise.” The language is obscure to moderns. It might have made more sense, however, to some ancients. That is, Heidegger appealed openly (with some modifications) to an ancient Greek conception of teleological nature or *physis*. For Aristotle, *physis* referred to an autonomous source or principle of movement in a living organism; Heidegger referred to it as an “emerging and arising in itself and in all things.” What some Greeks called *physis*, he explained, “we call earth,” or in the German, *Erde*.[23](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn23)

In this, Heidegger mirrored a number of twentieth‐century thinkers anxious about modern technology who looked to ancient ideas about nature as antidotes. Their aim was to resist the impulse to reduce life to a set of mechanical, causal relationships. *Physis* and teleology, by contrast, entailed a causal principle embedded in the living body itself; organisms, in this view, are both their own cause and effect. Or as Heidegger put it, earth ought not be understood as a “mass of matter deposited somewhere.” Heidegger wanted also to resist a second reduction. He worried about the displacement of earth by the “merely astronomical idea of a planet,” of *Erde* by*Erdball*.[24](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn24) In the images of Earth from space, he saw earth undone.

These images occluded a second existential horizon also, the one with which earth was paired: world. Although the concept evolved over the course of Heidegger's career, in this lecture it referred to a realm for human being opened up by artifacts, by great works of art above all. “World” refers to a scene for human life, for “the destiny of a historical people” to play itself out. It is also in some ways active and independent of man: “the world worlds,” Heidegger says. It is a “self‐opening openness.” The language is admittedly strange. As an illustration, consider what Heidegger had to say about Greek temples: “The temple, in its standing there, first gives to things their look and to men their outlook on themselves.” In other words, the Greek could be (or become) Greek only in the space opened up by the temple‐work. The temple also helps us see what Heidegger had in mind when he spoke of earth and world. The temple “roots itself” in the mountain; the stone of the mountain “juts through” the temple‐work in turn. Stone and the space opened up by the temple, earth and world, are therefore joined, albeit in a productive struggle that makes each what it is. In “setting up a world,” that is, the work of art also “lets the earth be an earth.”[25](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn25) But the view of Earth from space threatened both of these horizons for human being. If the view transformed earth into Earth, existential ground into planetary body, it did away with world by erasing evidence of artifice altogether. “Not a trace of human beings,” Blumenberg later remarked about the sight, “as if there had never been men, his works, his refuse at all!”[26](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn26) Whatever Heidegger's anxieties about the character of modern making, and they were legion, a stubborn fact remains: without human artifice, there can be neither earth nor world, no scene for being‐human.

Arendt voiced similar anxieties in *The Human Condition*. Like Heidegger, she made recourse to the categories of “earth” and “world” to describe dimensions of the human condition.[27](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn27) And like Heidegger, she worried about the eclipse of the grown by the made.[28](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn28) Some of her most potent language, however, was reserved for a related, inverted fear: the reduction of the made to the grown. At a still‐proximate reserve from the surface of the planet, for example, artifacts and the work required to produce them would appear as those of ants appear to human beings. Our cities would appear as hives, the act of making as the unconscious, unwilled activity of a species.[29](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn29) Even nuclear weapons, she hypothesized, could be understood in this way: as an unwilled strategy for holding population growth in check.[30](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn30) Arendt may have opposed the eclipse of the grown by the made for fear of doing away with one dimension of the background condition—the biological—out of which human beings emerge. But from a certain remove, that very process appeared as just the opposite: the eclipse of worldliness by earthliness, and the subsumption of human being into the metabolic sway of life and death. The perverse effect of modern technological acumen was to reduce the most artifactual of creatures to mere organisms. From space, the future of the human condition looked bleak.

There was something about a view of the planet as such that worried both Heidegger and Arendt. In part, their concern is exemplified by a lexical spill: from the word “earth” to the words “Earth,” “planet,” and “globe.” We often see Earth when we hear “earth,” and we refer to views of Earth almost indiscriminately as views of planet and globe. Heidegger and Arendt enjoin us to ask what prompts this slippage and what it implies. Should we do so, we are led to consider that for moderns to think of planets is already to think of globes, or that for moderns to marshal the intellectual resources required to think about planets implicitly means to relate to them in ways enabled by their intensive and extensive mapping. The naked Earth, in this view, is anything but. At least for moderns, it is “set up” or disclosed as a globe, as a map, clothed in an artifactual, if invisible, net. What appears as the Whole Earth is in fact just another instance of the technological globe—and still worse, a technological globe that masks its fact. We are fated to a globalization of the world picture, in this view, even when, strictly speaking, we see no globe at all.

The globalization of the world picture is perhaps easier to discern when we consider a parallel slippage—from “environment” to “globe” as it is inscribed in the phrase “global environment.” The term has become a platitude, even a ritual incantation. It is in truth a Frankenstein phrase that sutures together words referring to horizons of incompatible scale and experience. Environments surround us. We live within them. Globes stand before us. We observe and act upon them from without. Globes are things that we make. They are artifacts. Environments, at least in theory and in part, are not.[31](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn31) In the Earthrise era, however, “environment” has gone global (along with “economy” and “humanity”), and it is worth pausing to reflect upon what has been lost and gained in the process. Are all globalisms the same in the end, instances of a single kind of comportment, as Heidegger appears to suggest? If the globalization of the world picture began long ago or if it is coeval with the advent of modernity, as both Heidegger and Arendt imply, how are we to understand the globalisms of the Earthrise era? Do they represent something new? Or are they just another episode in the same old story?

These are the kinds of questions that Heidegger and Arendt help us pose. To get at them, let us shift gears for a moment and consider by way of cultural history two prominent forms of contemporary globe talk (the economic and environmental) and ask further after their shared origins in the years around 1970. The first is the globe of globalization theory. It is the globe of “globalization and its discontents.” It is the globe of Joseph Stiglitz and Thomas Friedman, of Seattle, the World Bank, and the end of Bretton Woods. Sometimes it is called the neoliberal globe, even if most of those who study it think the processes to which the term refers long preceded the post‐Earthrise popularization of the name. Some discover its origins in the eighteenth century, others in the nineteenth, still others in the late twentieth. It was born of European exploration, or colonization, or missionizing, or new state forms, or the world wars, or postwar finance. But whatever we call it, whenever and wherever we discern its origins, it is safe to say that the globe described by globalization theory antedated the appearance of Earthrise by far.[32](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn32)

Heidegger would have been happy to concede the point. The complaints voiced by globalization malcontents, on the one hand, and by the champions of alterglobalism (sometimes *autre‐mondialisation*), on the other, were voiced also—and vociferously—by Heidegger and his Weimar contemporaries.[33](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn33) But Heidegger would have insisted on something else: that we register the commercial globe as just one specimen of a more invasive species. Here, for example, is what he had to say in 1935:

When the farthest corner of the globe has been conquered technologically and can be exploited economically; when any incident you like, in any place you like, at any time you like, becomes accessible as fast as you like; when you can simultaneously “experience” an assassination attempt against a king in France and a symphony concert in Tokyo; when time is nothing but speed, instantaneity, and simultaneity … there still looms like a specter over all this uproar the question: what for?—where to?—and what then?[34](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn34)

Heidegger's answer, or one of them, Nazism, made the problems to which it appeared as a response look like the sorts of problems we should feel lucky to have. Still, he at least provides us with a working hypothesis: that the commercial globe is also—even first—a technological one. He also helps raise an important counterfactual query. Given that the critique of what is now called globalization long preceded the invention of the name, how are we to account for the lexical delay? Why did the vocabulary of “globalization” and “globalism” not flourish until the Earthrise era?[35](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn35)

The same questions arise when we consider the globe so often held up as an alternative to the commercially and technologically ordered planet. The “environmental globe” was born of the first photographs from space, or so the story often goes. In 1966, a young activist and LSD enthusiast named Stewart Brand peddled buttons inscribed with the question “Why haven't we seen a photograph of the whole Earth yet?” He hoped the view would work as a hit of cultural acid, a trip he helped abet with the cover of his *Whole Earth Catalog*. Brand's expectations were vindicated. The Whole Earth eclipsed the mushroom cloud as the galvanizing icon of the age, for a nascent environmental movement above all. Blumenberg thought it no coincidence, for example, that the German word *Umweltschutz*(environmental protection) was coined shortly after “Earthrise.”[36](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn36) James Lovelock's Gaia hypothesis—that Earth is a self‐regulating superorganism—may have been formulated as early as 1967, but it flourished only in the late 1970s and 1980s.[37](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn37) And in the intervening years, the environmental globe has been held up as an organic alternative to the runaway artifactualism of its technological competitor. In other words, the organic globe is arguably no globe at all. Its latitude is the mountains, its longitude the rivers and seas, its graticule the contours of the Earth.

In this series of readings, the commercial and environmental globes map neatly onto the distinction between organism and artifact. In this series of readings, Heidegger and Arendt were wrong. But there is more to this world picture than meets the eye. Many of those credited with inventing (or reviving) the idea of an organic Earth imagined it as a technologically ordered globe as well. Brand's catalog, for example, was subtitled “Access to Tools.” His embrace of cybernetic technoscience was sometimes expressed in a rhetoric that would have made the most assiduous of Earth‐exploiters proud. “We are as gods,” he wrote in the initial lines of his catalog's first issue, “and might as well get used to it.”[38](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn38) His injunction also bears out Marshall McLuhan's assessment, at first glance puzzling, that ecological thought was enabled—not contested—by a grasp of the planet as a work of art. With *Sputnik*, that is, “the natural world was completely enclosed in a man‐made container. At the moment that the Earth went inside this new artifact, Nature ended and Ecology was born.”[39](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn39)

McLuhan exaggerated. The artifactual envelope in which Earth is now clothed—and it *is* clothed, as any map of satellite paths and space junk can attest—took time to develop.[40](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn40) (See [Figure 6](http://www.jstor.org/action/showPopup?citid=citart1&id=fg6&doi=10.1086%2Fahr.116.3.602).) But McLuhan was right to suggest that ecology could constitute Earth as an object of technical decree.[41](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn41) Take again the case of one‐time NASA engineer Lovelock. In one breath, he could speak of the return of an ancient belief (Gaia) and an ancient understanding of nature (akin to *physis*). In the next, he could invoke that belief on behalf of some wild ideas for planetary management. For example, he hypothesized that future generations—recognizing themselves as Gaia come to consciousness of itself, their technological powers as Gaia's own—might stave off runaway glaciation by loading the atmosphere with chlorofluorocarbons, thereby instigating a greenhouse effect. The Gaia hypothesis may have been for those “who like to walk or simply stand and stare,” he explained. It was for people like Heidegger, who compared his version of thinking to wandering, “planetary” in the original sense of the word.[42](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn42) But Gaia was in fact just another name for a scientific discipline, which aimed at the technical control of the planet. Sometimes it went by the name earth systems science, sometimes by geophysiology.[43](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn43)

In the years since, Lovelock's example has proliferated. We now picture Antarctica, for example, much the way we look at an ailing brain.[44](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn44) The neo‐vitalist language of planetary ailment (“the Earth has a fever”) is often coupled with a technical language of medical diagnosis and cure.[45](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn45) Meanwhile, both Lovelock and Brand have become leading prophets in this, our age of global warning. Both have transformed the Whole Earth icon into its apocalyptic twin, an update to the mushroom cloud it once displaced. Gaia, they say, is now more liable to visit death upon humankind than life. She will have her revenge, Lovelock warns, unless forestalled, as Brand urges, by the “Whole Earth Discipline” of planetary engineering under corporate sponsorship.[46](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn46) In sum, the organic globe may be as much a technologically ordered globe as the commercial globe that so many environmentalists decry—and in many instances, it no doubt is.

Still, there is something unsatisfying about the story with which we are left should we take Heidegger and Arendt as our guides. Does the complicity of organic Earth with technological globe truly indicate that Whole Earth and mushroom cloud, Gaia and globalization, are just two sides of a coin? In some ways, yes: our stories about the Earthrise era ought to accept that it represents a chapter in the globalization of the world picture. Still, we ought to countenance alternatives. There are stories to be told about the Earthrise era that accept the insights of Heidegger and Arendt while remaining wary of both their dystopian diagnoses of modernity and the techno‐cybernetic religion they aimed to defeat. Still more, there are stories open to the possibility that the Earthrise era transformed the “world picture” itself, that it introduced new ways in which our pre‐cognitive experiences of earth and world are organized—and the example of Hans Blumenberg can help to point the way.

One of the more curious episodes in the history of space exploration was the disbelief expressed by so many at the photographic shots of man on the moon. How could the American flag appear to flutter on a moon without the atmospheric preconditions for a breeze? Why did the lunar landscape not look more alien, and less like the Arizona desert by night? Didn't these and other oddities show that the entire thing was staged? Were the photos of footprints in the dust just the less accomplished hoax of an American Cold War update to Descartes's “deceiving demon”?

Blumenberg mulled over these questions in his monumental book on the genesis of the Copernican world, and he came to the following conclusion:

During this decade of astronautics only one single picture could not have been invented, but simply went beyond anything the imagination could have anticipated: the picture of the Earth from space. If one tries to relate the centuries of imaginative effort and cosmic curiosity to the event, then the both unexpected and heart‐stopping peripety of the gigantic departure from the Earth was this one thing, that in the sky above the Moon one sees the Earth.[47](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn47)

Plato and Cicero may have described the sight in advance; Fontenelle and Voltaire, too. Archimedes and all those who worked in his spirit, all those who had imaginatively projected themselves into the beyond that they might better work upon the Earth—all these preparatory moments, Blumenberg insisted, could not have prepared us for the effect of the view itself. The Earth, it turns out, is lovely, and to see it is to wish also to return.

Blumenberg's ruminations were an instance of “astronoetics,” a word he coined to name the age‐old tradition of contemplative reflection upon the cosmos, for which astronautics has been a recent aid. The word derives from *noesis*, thought or intellection, and among the ancients was contrasted with *aisthesis*, sensation. Blumenberg aimed to recall just this opposition. In 1958, when he invented the term, he was a thirty‐eight‐year‐old professor at the Christian‐Albrecht University in Kiel. The meager resources at the smallish school had led many of its professors to pursue research by thought experiment, without the help of costly instruments. This put them at a disadvantage vis‐à‐vis their wealthier peers, especially when the launch of *Sputnik* unleashed concerns about a “research gap.” Blumenberg therefore proposed to do what *Sputnik* could not: he would explore the dark side of the moon by “pure thought” alone. Astronoetics would hardly fill the lecture halls, he reasoned. Nor would it compete for monies devoted to the physical exploration of space. It was best suited for those consigned to the group of *Daheimgebliebenen*, those whom astronautics had left behind at home. It was suited for those more content to contemplate and dream than to do, those who preferred *noesis* to *nautes*, reflection to travel, who preferred to sail the seas of the stars by means of the seas of the mind.[48](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn48)

Blumenberg's proposal was made partly in jest—in addition to his courses, he proposed to found a journal with a “correspondingly modernist name.” But his jest has since been vindicated. The age of astronautics seems destined to be an interlude of several decades in a history of astronoetics thousands of years in the making. Only twenty‐four human beings have departed Earth's orbit and seen the Earth whole, and not one since 1972. Still, astronautics has bequeathed to astronoetics a legacy that cannot be ignored, in the form of photographs of the Earth. After “Earthrise,” the story sometimes goes, astronoetics would never be the same. But was this in fact the case? Given the tradition of looking back on Earth by means of thought alone, what, if anything, makes the photographic sight of Earth any different?

It is difficult to say. For every claim to novelty, there is a competing claim for precedent.[49](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn49) But Blumenberg thought it had to do with its effect—the centripetal pull of the photographed Earth on the hearts of those who looked back. Heidegger was wrong, Blumenberg held. The sight was alienating, but only through that alienation could a new kind of rootedness ensue—not at the expense of a planetary consciousness, but in its name. “It is only as an experience of turning back,” as he concluded his book, “that we shall accept that for man there are no alternatives to the Earth, just as for reason there are no alternatives to human reason.”[50](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn50) Only after we have escaped the physical and existential confines of our Earthly “prison” do we recognize the prison for that which it is—all we have.

In some respects, Blumenberg's reaction was typical, epitomized in the bumper sticker that informs tailgaters across America that “good planets are hard to find.” Still, one dimension of his conclusion is cryptic. Why the parallelism? What does looking back upon Earth have to do with reason? Why speak of “human reason” in particular? And why is an experience of turning back the necessary condition for it all? The line and the questions it raises tell us something important about what Blumenberg hoped to accomplish: to vindicate the modern age against the critiques levied by those (such as Heidegger) who had discovered in modern technology a form of reason run amok.

Blumenberg's classic statement on this count arrived in 1966, in a book titled *The Legitimacy of the Modern Age*. It is one of the most ambitious revisions of Western intellectual history ever ventured. The modern project, he conceded, suffered from an illegitimacy complex, and its technological excesses were unfortunate but understandable reactions to this felt deficiency. But Blumenberg wanted to go one step further. He aimed to save the modern age from its felt compulsion to rebel against the premodern sources of authority it sought to overcome. These were two above all: teleological nature and the biblical God. Each in its way belittled human artifice. The first was associated with the ancient injunction that art was to imitate nature, the second with ancient and medieval ideas about divine creativity. In turn, overcoming these traditions entailed the invention of a new science that sought the artful domination of nature by vesting in man the creative capacity of a God. Blumenberg hoped to rein in the radicalism of this overcoming by emancipating us from its felt need.[51](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn51)

His astronoetic enterprise proceeded along similar lines. He aimed to save the Copernican insight, but to temper some of the baleful, if unintended, effects of its associated science. He wanted to give the Copernican turn a final twist. This meant, above all, to put Earth in its place. It meant to yoke Earth back to the center of our attention by insisting on an Earthly eccentricity that not even Copernicus had countenanced. “A decade of intensive attention to astronautics has produced a surprise that is, in an insidious way, pre‐Copernican,” Blumenberg observed. “The Earth has turned out to be a cosmic exception.”[52](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn52) The radical eccentricity of the Earth made it paradoxically all‐important. Only by being humbled still further could it be ennobled in post‐Copernican eyes.

Blumenberg appealed to a similar line of thought with respect to reason. It, too, had its place. Like Earth, reason was eccentric, and it was eccentric, in part, because it was Earth‐bound. This ran contrary to the expectations of many Enlightenment thinkers, who proceeded as if the universality of reason meant just that—that it was a property in the universe at large. Kant, for example, was careful to speak of rational beings, not specifically human beings, when he outlined his metaphysics of morals. Fontenelle had conjectured that reason might be better exercised by the inhabitants of the moon than on Earth and by men.[53](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn53)

All of this Blumenberg rejected. It was, in fact, Enlightenment unease about the “terrestrial contingency” of reason, he held, that had led to the postulate of inhabited, otherworldly worlds in the first place. Reason was neither “the summit of nature's accomplishments” nor “a logical continuation of them.” It was instead an accident of evolution, a deviation in the animal man, and to call it universal was in truth to seek a false, if powerful, anthropocentric consolation for the original Copernican trauma. A “true Copernicanism” would have no need for such solace, would insist instead on a thoroughgoing anthropo‐*eccentrism*—in the form of human reason understood as merely human, as all too human, with both the promise and the deficiency the locution implies. True Copernicanism entailed modesty about what man, with his reason, might accomplish, but also an acceptance that reason, like Earth, is all man has. True Copernicanism was therefore the astronoetic expression of the cure Blumenberg proposed for the felt illegitimacy of the modern age writ large.[54](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn54)

Astronautics was unlikely to confirm or falsify these positions in the abstract. It could, however, generate a visual experience that made the questions of exobiology and exorationality a practical dead letter. This experience was in part a matter of aesthetic pleasure. In the age of astronautics, the view out had proved disappointing. The cosmos was simply “too deserted, too monotone, too poor,” Blumenberg decided, to satisfy us for long. By contrast, the Earth was a sight to marvel. Only this could account for the alacrity with which the manned exploration of extra‐orbital space was brought to an end. Only as a “purely sensory phenomenon” could it have prompted the geotropism it did.[55](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn55) This, in part, is what made photographs of the Earth different from their astronoetic predecessors.

Blumenberg also had philosophical reasons for insisting on the priority of a visual encounter with Earth. To consider the point, he looked to a thought experiment broached early in the twentieth century by the mathematician‐philosopher Jules Henri Poincaré. Poincaré asked about the conditions of possibility for a Copernicus. He wondered whether an Earth forever shrouded in clouds, or the melancholy circumstance of human beings who had never seen sun or stars, trapped in an “atmospheric cave,” would have precluded the Copernican conclusion. Poincaré's answer was no. The Copernican discovery, he reasoned, was “blind.” It relied not on sense impressions but on dispelling the optical illusion that most readily presents itself to the pre‐critical mind: that the sun revolves around the Earth. It was in the end as a physicist, not an astronomer, as a mathematician, not a spectator, that Copernicus had achieved his breakthrough. Still, Blumenberg had his doubts. The radicalism of the Copernican revolution, after all, was intelligible only against its historical background—the millennia‐old tradition of sensory observation. Copernicus could opt for physics only because he was first an astronomer; he could opt for blind science only because he first could see.[56](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn56)

Earthrise gave civilization a new perspective – the size of the Earth hanging in space reminded the population of their cosmic insignificance

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Enter “Earthrise.” There was something about the view of Earth adrift in a cosmic desert that allowed for a pre‐Copernican experience joined to a post‐Copernican science. Somehow, images of the Earth from space made the problems of magnitude and eccentricity irrelevant—the fact that Earth is tiny, man still smaller, and at the center of absolutely nothing. Seeing the planet from afar did not produce new scientific knowledge to blunt that trauma's force. The sight of an incomparably lonely living Earth, however, did produce a felt experience of a planet so eccentric, so exceptional, that it became the only thing worth attending to in the first place. The decisive thing about the view from space, that is, was “a revision that brought to an end the Copernican trauma of the Earth's having the status of a mere point—of the annihilation of its importance by the enormity of the universe. Something that we do not yet fully understand has run its course: The successive increases in the disproportion between the Earth and the universe, between man and totality, have lost their significance—*without its having been necessary to retract the theoretical effort*.”[57](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn57) Heidegger worried that thinking globally precluded being locally. The Earthrise era, Blumenberg thought, would enable us to do both at once.

“Earthrise” and its kin had this effect insofar as they “reterrestrialized” the globe. They turned the globe back into Earth. On this count, Blumenberg spoke from experience. “When the first photos from space … showed the Earth glimmering blue in the universe, there were perhaps others like me,” he supposed, “who were momentarily astonished to see nothing of the net of latitude and longitude, nothing of the line of the equator, as every globe had impressed it in photographic memory [*eidetische Erinnerung*].”[58](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn58)

At first glance, Blumenberg's recollection only confirms Heidegger's suspicions. His astonishment was born of dashed expectations, internalized since childhood, that made it difficult to imagine Earth in anything but the form of a globe, the planet as anything other than a map. But Blumenberg was hardly a child by the time he encountered these photos. He was well into his fifth decade. His surprise cannot be chalked up to the experience of a knowledge suddenly undone, and this makes his observation all the more interesting. The experience of seeing the Earth from afar provided something that prior knowledge could not. For one, it reawakened an ancient prejudice about the priority of nature to art. Blumenberg had once imagined Earth as an imitation of the globe. But its sight disclosed the globe as an imitation of Earth, the artificial planet as an imitation of the natural one, and a poor imitation at that. Set next to one another, the planet‐organism quite simply made the globe look ugly. “Every globe,” Blumenberg remarked, even the most artful of globes illuminated from within, would forevermore appear with a “hitherto unremarked wretchedness,” for the simple reason that “a star can't look like that—only a construct.”[59](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn59)

The point, once recognized, was self‐evident, he thought. But for those in need of proof, Blumenberg recommended an excursion to Disney World. The Experimental Prototype Community of Tomorrow, or EPCOT, had a dubious distinction. It housed the most wretched globe of them all: a gigantic sphere, clad in aluminum, constructed as an imitation of Earth. (See [Figure 7](http://www.jstor.org/action/showPopup?citid=citart1&id=fg7&doi=10.1086%2Fahr.116.3.602).) Visitors spiral through its bowels. In the span of fifteen minutes, they pass a series of displays encompassing the entirety of human history, its proximate prehistory and future. Blumenberg described the show as just the latest update to a type. It is characteristic of a certain fantasy, he observed, “that what began in the caverns of the Earth should find its alleged completion in the colossal artificial cave of a technodrome.”[60](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn60)

Disney's attraction added a new twist. It was not just an imitation of Earth. It was an imitation of Earth as a spaceship—that is, an imitation of an imitation, and an imitation of a prior displacement of earth by artifact at that. Suffice it to say that Blumenberg was not pleased. Spaceship Earth: “That is a defamation,” he cried. “Earth means precisely that to which all spaceships return. The Earth is the opposite of a spaceship … The pitiful sensation in Florida, to see the Earth, as it were, from beyond, for oneself ”—all this came at an exorbitant price. The spectacle was bought at the cost of Earth's very “function as ground [*Boden*].”[61](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn61)

Arendt had despaired over the impulse to manufacture a planet, and to look back upon the Earth from its artificial ground. Heidegger did, too. Blumenberg's worry was a bit different. He fretted over those whose Disney adventure would supplant the true meaning of the sight that Arendt and Heidegger decried. Would EPCOT lead its visitors to conclude that for man “the name ‘Earth’ has nothing to do with spaceships and planetary wandering, but with firm ground under the feet as the condition for every coming‐to‐rest”? Probably not. The sight was more likely to confound than to confirm Husserl's dictum that the original origin, earth, does not move. The experience of “Earthrise” was supposed to reverse the globalization of the world picture, or to initiate a new one altogether. It was the saccharine crime of Disney, in a small way, to preclude it.[62](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn62)

Still, there is a deep irony in all this. The sight Blumenberg thought was transformative, the one no imaginative exercise could have anticipated, the one that “could not have been invented,” that “in the sky above the moon one sees the Earth”—the irony is that this view *was* invented. It was made available only by a reorientation of the frame so that the lunar horizon appears below, as our everyday experience of our earthbound condition would lead us to expect. (See [Figure 8](http://www.jstor.org/action/showPopup?citid=citart1&id=fg8&doi=10.1086%2Fahr.116.3.602).) If the sight dispelled Blumenberg's photographic memory of Earth in the form of a globe, it could do so only after it had been reframed to conform to a pre‐critical expectation—the geospatial intuition that there is indeed earth, whether terrestrial or lunar, beneath our feet. Blumenberg's experience was born in part of reality, but not the one he thought captured in “Earthrise.” It was born of the pre‐cognitive recalcitrance of his earthbound condition. His experience was born also of desire—the desire for a frame beyond the technological ordering that Heidegger had identified, a counter‐enframing perhaps, but an enframing nonetheless. It replaced one photographic memory with another, one hallucination with a second.

Were Blumenberg still with us, he might well point out that this enduring uncertainty only reaffirms the need for astronoetics in the first place. It is an exercise, after all, meant to pitch to and fro between the competing attractions of “pastoral idyll,” on the one hand, and “the plain preparation of precise knowledge,” on the other—or, put a bit differently, between Heidegger's errant wandering and the techno‐scientific project of planetary management.[63](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn63) Astronoetics, he might say, helps us see how in looking back at the Earth we escape some entanglements, but with a newfound sense for others we would like to affirm. Even if Earthrise was picture first, experience second, it could still prompt a transformation: a return *to* Earth by way of the rise *of* Earth in the pictorial imagination.

Whether this hope will come to pass remains to be seen. Blumenberg's oversight, after all, alerts us in miniature to an important point. The story of the Earthrise era is not just about Cold War origins and the space race, let alone a feel‐good tale about ecological awareness. Resituated in a new context (the history of organisms and artifacts in the modern era), Earthrise and its afterlives become just as much a story of error, blindness, and forgetting. Of error: Blumenberg's mistake shows that to look at the Earth in the sky above the moon is in fact to gaze upon the Earth‐organism as pictorial artifact, Whole Earth as world picture. Of blindness: many have espied in Whole Earth an organic icon, but if we follow the lead of Heidegger and Arendt, we must ask whether Whole Earth has always been a globe in disguise, and “global environment” just one of several competing but also complicit globalisms in the Earthrise era. Last, Earthrise is a story of forgetting. To focus on how the view of Earth from space was overtly mobilized is to miss some of the more subtle effects of this sight after we ceased to register its novelty—after we ceased, in a fashion, to see it.

This last is the most difficult to address. How are we to write a history of something that “disappears” in its ubiquity? How are we to write a history of an imagination that becomes all the more important as it disseminates and fades, as it seeps into the mental architecture that conditions our most basic, everyday experience? It is one thing to trace the spread and use of the images themselves—their visible appropriations, whether by environmentalists, oil executives, humanitarians, cold warriors, or jihadis. It is one thing to account for the uneasy convergence of Earthly vision with global vocabulary by resituating the history of these photos in a broader story about what has happened to organisms and artifacts in the modern age. But it is something else to track how the planetary horizons afforded by photographs of the whole Earth have surmounted, inflected, complemented, or corrupted the earthbound horizons of everyday experience. To do so would be to trace the effects of that dissonance described by Husserl, produced by living locally while thinking globally, and to address the question: How did the experience of this split between life as lived and life as known change once we came to see in pictures what Husserl could only imagine? Doing so would provide a window on what it means to live in a world in which “Earthrise” has risen, and in which it has more recently set—or settled, in the seat of human perception, where it acts upon us in ways we often do not notice. The term “Earthrise era” does not quite capture this development, since it foregrounds what in this instance is more important as background. As homage to Arendt, let's call it a “post‐Earthrise condition” instead.

The term entails fealty, but also sedition, because as a historical development the phenomenon poses a challenge to Arendt's ideas about the “human condition.” With some exceptions, most historians are not accustomed to making use of categories such as the human condition. And for good reason: It smacks of a place anterior to culture or society or meaning. It seems better left to paleoanthropologists willing to venture into the distant past (“prehistory”) or to philosophers like Heidegger and Arendt willing to broach ideas about the deep present—in this case, that we are earthbound creatures, that we inhabit man‐made worlds, and that residues of this earthliness and worldliness are embedded in everything that we are and do.[64](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn64) But the concept is not totally foreign. Their vocabulary of earthliness recalls a category to which historians are accustomed: “environment,” understood broadly as that which surrounds and conditions us. And their vocabulary of worldliness echoes in a second category: “space of experience,” which historians use to speak of urban cityscapes, changing skylines, and the new sorts of sensory and mental lives they afford or inflict.

Still, we would be remiss to disregard how the post‐Earthrise condition stretches these categories to their limits. The sedimentation of Whole Earth iconography into the mental architecture of the West means that for the foreseeable future, environment will be inflected by planet, cityscape by globe, and skyline by space—not the “space of experience” but the void. The lived experiences of earthliness and worldliness, at least as Heidegger and Arendt imagined them, are available, if they are available, only against the background of this new dispensation. What they pursued as a philosophical inquiry is therefore best continued as a historical one.

What is to be gained by such a history? And how are we to write it? To the first question, the answer is a rich, textured account of what it has meant to live, feel, and know in an age when human beings finally came to see what they for millennia could only imagine—the whole Earth. Regarding the second, if we take seriously the proposition that photographs like “Earthrise” have abetted the globalization of the world picture by supplementing one set of horizons with another, we need first to think more creatively about where to look for the relevant evidence.

Consider, as one example, a series of diverse instances in which the recalcitrance of our earthbound condition has asserted itself against an imagination gone global. We have just read of this recalcitrance in Blumenberg's recollections. We hear it in a remark by William Anders, the astronaut who captured the iconic “Earthrise” on film, when he observed that “all of us subconsciously think that the Earth is flat.”[65](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn65) We find it in the art of Robert Smithson, a pivotal figure in the movement of the late 1960s and early 1970s called “Earthworks.” His famed *Spiral Jetty* (1970) in Utah's Great Salt Lake is a sustained reflection on the incompatibility of planetary and cosmic scale with the earthbound fragility of human life.[66](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn66) We (or our psychologists) also watch it at play in children. When asked to draw earth, sea, sky, and beyond, they reveal the partial truth of Husserl's axiom by producing a circular planet floating against a background of clouds and stars mixed indiscriminately together. They combine the Apollonian perspective that affords the form of the circular Earth with two earthbound experiential horizons—the ones marked by earth and sky at night and by day.[67](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn67) (See [Figure 9](http://www.jstor.org/action/showPopup?citid=citart1&id=fg9&doi=10.1086%2Fahr.116.3.602), esp. b, d, and f.) And a final example: we find it encoded in a series of posters disseminated by the Green Party of Germany that assert the claims of the earth‐sky horizon against the Earthly vision and global vocabulary of the Earthrise era. (See [Figure 10](http://www.jstor.org/action/showPopup?citid=citart1&id=fg10&doi=10.1086%2Fahr.116.3.602).) They indicate that the most everyday of experiences—looking up—has acquired political significance. They indicate that the meaning of sky has changed.

All these examples point to the combination, and also the clash, of the earthly with the Earthly that now conditions human experience. And the diversity of those whom it affects (philosophers, artists, astronauts, politicians, and children subjected to psycho‐scientific machinations) says something about its scope. It is wide, and it is deep. In this light, the statement that “thinking globally” is now less our choice than our lot ought to be emended, to allow for a post‐Earthrise condition in which the global is sometimes coeval with, not posterior to, the thinking, and in which the thinking is entwined with feeling and sensing.

There is reason for ambivalence about this development. To be sure, there is environmental awareness, concern for the planet, even feelings of mystical communion with the Earth. But for every impulse to care, there are injunctions to manage and control. For every encounter with wholeness, there are by definition moments of terrific alienation. In the testimony of Apollo astronauts, these moments tend to come when the Earth has shriveled to the size at which the brain can cognize it as a distinct object—not when the Earth is first visually surveyed, but farther out, when the eyes absorb it in its entirety in direct line of sight, grasped all at once as a whole.[68](http://www.jstor.org/stable/10.1086/ahr.116.3.602#fn68) But what of the rest of us, those for whom the Earthrise era is no astronautic adventure but an astronoetic one, launched by the pictures the astronauts brought back? Have we shared in these doubled‐up moments of plenitude and estrangement also? Almost certainly, albeit in a different key. A full account of this trip must wait for now. But to begin, just reflect on the vertigo that can well up when Whole Earth comes to mind and we register that, yes, somewhere down there on that great blue ball is us.

A. list of Canadian poets of the last half century whose work exemplifies cosmopolitan tendencies would likely not hold Don McKay’s name at the top. Critics of his ten poetry collections and two essay collections have chiefly understood McKay’s work within the context of ecopoetics and post-Romantic thinking (see, for example, Alanna F. Bondar, Adam Dickinson, and Sophia Forster). This is understandable; however, his poetic and non-fictional meditations on non-human nature, and especially geology, have provocative implications for contemporary cosmopolitanism discourse and suggest an unexplored link between two scholarly fields pertinent to his work. In order to elucidate these broader implications of his writing, and to thereby balance the current critical appraisal of McKay as nature poet par excellence, a view that risks underestimating those broader implications, it is first necessary to clarify the salient characteristics of cosmopolitanism.

At present, there is little scholarly consensus on what cosmopolitanism entails—does it describe a mere familiarity with world cultures; does it describe the real experience of postnationalism, of international travel and migration; is it primarily an aesthetic, an ethic, or both? Besides this semantic difficulty, however, the more obvious reason for McKay’s position [End Page 165] on my hypothetical list of cosmopolitan poets is that, unlilke some others such as Irving Layton, Gary Geddes, and Michael Ondaatje, McKay rarely takes a sustained look at other (human) cultures in his verse. It is rare that he publishes poems that start and end in a “foreign” culture, and instead of populating his work with fleshed-out humans, he more often focuses on the natural world, self identifying as a nature poet in essays like “Baler Twine: Thoughts on Ravens, Home and Nature Poetry” and “The Bushtits’ Nest” (Vis à Vis 2001) and in his 2001 interview with Ken Babstock. question then becomes whether nature poetry necessarily precludes a sophisticated engagement with ideas from around the world and, more specifically, relevance for cosmopolitanism discourse. When McKay’s poet-speaker explores his interaction with the otherness of nature, grappling with challenging epistemological and ontological issues, does the absence of other in-the-flesh people in the poem negate the mental expansiveness displayed? answer, of course, is no. In fact, McKay’s poetics, especially as it is focused in his recent collection, Strike/Slip (2006), winner of the Griffin Poetry Prize, offers a valuable reconception of global connectivity based on a shared link to geology, a link that cuts across (or beneath) cultures and which is mutually supportive of his ethics of appropriation.

The task of identifying the implications of McKay’s poetry for cosmopolitan discourse, aside from what might appear as his “uncosmopolitan” content, is also complicated by his consistently ironic and playful tone (see Forster) and by his “self-effacing poetic persona” (Cook ix). This trademark humility, playfulness, and eschewing of appropriation is identified by numerous commentators on his work, such as Brian Bartlett, Kevin Bushell, Méira Cook, Forster, Ross Leckie, Travis Mason, and McKay himself, and it makes difficult the isolation and generalization of his philosophical positions from his poems. Typically, his self-conscious poet-speakers either attempt to limit impositions on the world observed, which includes limiting any prescriptive philosophizing, or else they fail in their appropriations in such a way that McKay’s disapproval becomes clear. poet, writes Travis Mason, “sets the offhand—the impromptu and distinctively un pretentious—against Poetry, capitalized here not incidentally, as a way to represent and value the more-than-human world with a measure of humility” (88). This reverence and humility, often conveyed through self-deprecating humour, may also explain why McKay is hesitant to explicitly extend the implications of his ecological ethics to the realm of human interaction. Yet, close reading of his poems, especially those in Strike/Slip, and his essays reveals that his ideas can change the way we understand the interconnection of diverse cultures, and therefore the [End Page 166] concept of cosmopolitanism, by providing a spatial conceptualization of that connection and an ethics.

The resurgence of interest in cosmopolitanism in the last twenty years was prompted by rapidly advancing information technology and rapidly increasing human-induced environmental damage, both of which continue to force diverse cultural groups to rethink their interconnectedness. The phenomena of global terrorism and the proliferation of transnational corporations are also responsible for causing a renewal of interest in cosmopolitanism. Hence, theorists like Amanda Anderson and Jacques Derrida call us to look again at the concept and see what can be learned by tracing its impulses back to earlier philosophical approaches to theorizing multiculturalism and human interconnection generally. Anderson puts the theory in its simplest terms: “[C]osmopolitanism endorses reflective distance from one’s cultural affiliations, a broad understanding of other cultures and customs, and a belief in universal humanity” (267), and her definition is in keeping with the entry for “cosmopolitan” in the Oxford English Dictionary: “Belonging to all parts of the world; not restricted to any one country or its inhabitants.” Common to most definitions is the idea of connections across cultural barriers, connections of varying depth and duration, and for diverse purposes. The concept has also historically been associated with travel and aestheticism—with the trade in “foreign” goods, orientalism, and the young Englishman’s grand tour, for instance—but the theory reduced to such does not sufficiently explain how interest in other cultures translates into real-world politics or how cosmopolitanism affects the disadvantaged.

The problems that plague theorists of cosmopolitanism centre on elitism, appropriation, and the loss of the local in the global. In order for cosmopolitanism to become a coherent and viable set of ideas upon which to base legislation, theorists must address these three issues. Anderson notes that “cosmopolitanism . . . typically manifests a complex tension between elitism and egalitarianism. It frequently advances itself as a specifically intellectual ideal, or depends on a mobility that is the luxury of social, economic, or cultural privilege” (268). In a similar comment on elitism, Gilroy further argues that the practical applications of what he terms “armored cosmopolitanism” often result in imperialistic military and economic interventions (60). Gilroy, Derrida, and others urge us to look at the elitism inherent in cosmopolitanism at the level of access to education and travel and also to extend the discussion to the most fundamental level of human rights. Mike Featherstone, however, cautions us not to oversimplify the issue of elitism as simply a matter of “have and [End Page 167] have not” nations: “ [J]ust as there are ‘information rich’ nations on a global level there are also ‘information poor’ ones[, and] within localities there are clear differentials, with the wealthy and well-educated most likely to have access to the new forms of information and communications technology” (117). Cosmopolitanism is about connections between people across distance, but information technologies—from books to telephones to the internet—only connect the privileged to any significant degree. Though headway is being made in expanding their availability, the more recent and costly information technologies remain largely inaccessible in many of the world’s poorer communities (un 5), leaving a large proportion of humanity cut off from the rich experiences offered by cosmopolitan exchange.

The issue of cultural appropriation—the authorized or unauthorized “use of something developed in one cultural context by someone who belongs to another culture” (Young 5)—also plagues cosmopolitanism’s articulators. The discourse shares with postcolonialism a concern over exploitative appropriation of the cultural artifacts, language, or rituals of other social groups, especially of those in a position of relative powerlessness. For example, when a cosmopolite visits another culture and returns bearing new words, foods, or artistic forms, do those cultural products invariably become perverted once removed from their “proper” setting? Does colonialism’s history of such appropriations inevitably taint all future encounters? James O. Young argues that not all appropriation, at least artistic appropriation, is negative; rather, such exchanges, conducted with due respect, can be productive of mutual understanding and of valuable new cultural products (152).

But, even when conducted with the best of intentions, does appropriation on a mass scale entail the complete dissolution of local culture? Many theorists have doubted the ability of a distinct local culture to maintain its unique quality when faced with sustained touristic and/or economic exchange. Featherstone, for instance, warns that it is where “the international economy and communications networks will produce … homogenizing effects in other areas of national societies that we run into problems” (115). He acknowledges this threat but clarifies that “in many cases it may be that various forms of hybridization and creolization emerge in which the meanings of externally originating goods, information and images are reworked, syncretized and blended with existing cultural traditions and forms of life” (117). Bill Ashcroft makes a similar claim: “[L]ocal culture is not simply a passive recipient of global influences[;] the appropriation of global forms can be instrumental in the construction of local identity” (162). While these claims are partially true, a threat remains when the [End Page 168] global trend is increasingly toward American cultural and economic domination. Neither Featherstone nor Ashcroft convincingly locates the line where too much appropriation in either direction results in the loss of local culture. Voicing similar reservations, theorists like Derrida and Gilroy remain unconvinced of the resilience of less powerful cultures to the encroachments of the more powerful.

With these cruxes in mind it is reasonable to ask, in the context of the global development and exchange of natural resources, what nature poetry such as McKay’s can teach us about ways to approach the other, ways of circumventing or minimizing the problems that arise from cosmopolitanism. McKay’s poetry offers a useful way of thinking about the other, and while he discusses otherness largely in terms of the non-human his ideas have applicability for human interactions. He explains in essays and dramatizes in poetry how a subjectivity shaped by humility and close attention can best encounter otherness—a process of encountering that is realistic about its limitations and is likely to succeed in mitigating human conflict and encouraging stewardship of the earth. Moreover, his intense and prolonged imaginative interaction with geology in Strike/Slip offers both strong evidence of our common link to the earth and a useful way to conceptualize that bond, what I call a spatial conception—a metaphorical and/or a physical model for understanding humanity’s interconnectedness, an idea that can be easily held in mind because it has a spatial component which can be used as the basis for further thought. In the case of Strike/ Slip, the spatial conception is that of the earth’s mantle connecting diverse animals, plants, and human communities, providing a common bedrock from which even the most rarefied of our cultural products and practices ultimately and literally originate.

We need only look to Karl Marx’s spatial model of social structure to realize that such conceptualizations can have profound real-world effects, insofar as they form a foundation upon which to build other ideas that can be enacted in the political arena. In his introduction to A Contribution to the Critique of Political Economy (1859), he famously identifies “the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness” (20). His language suggests architecture—of foundations and erections, especially insofar as the cultural emanations of the superstructure are more ephemeral. This visual conception is pedagogically useful, though numerous commentators stress that discussions of base/superstructure can quickly become reductive (see, for example, Raymond Williams). [End Page 169]

Spatial models of society like the Marxist and earlier models, such as the great chain of being, which was derived from Aristotelian and Platonic thought and elaborated by Christian theologians in the Middle Ages (O’Meara 15–27; Lovejoy 25), imply an ethics. While scholars are divided on whether or not Marx’s critique of capitalism was essentially a moral one (Reiman 143), the superstructure/base model suggests that cultural institutions are expendable in the service of emancipating the proletariat whose labour drives the economic base. Likewise, the great chain of being model entails morality, especially the subordination of each link to the next higher one (Lovejoy 59–66). In both of these cases, the ability to conceptualize social formations spatially serves a pedagogical function and, thereby, a political one. Arthur O. Lovejoy, for example, notes of the great chain of being that it “was to have consequences of great historical moment” (61) in everything from monarchical succession to the natural sciences. McKay’s poetics, therefore, though offering a more exploratory, meandering tack in addressing issues of social connectivity, can provide a similarly suggestive spatial conception.

His work also offers a practical ethics of appropriation. Many theoretical problems in the field of cosmopolitanism centre on exploitative appropriation, but McKay’s poetry and philosophical writing offer a strategy for mitigating the negative effects of the phenomenon, especially the appropriation of the natural world. Because of the playful tone of many of his poems, it may seem that he does not revere the natural world he describes. Yet, for him the appeal to humour does not entail irreverence but is rather an attempt to deflate the poet’s own pretensions and those inherent in language itself, thereby minimizing any appropriation of the natural world, of wilderness (see Bushell, Cook, Forster, and Mason). But when McKay, in his essay “Baler Twine,” defines wilderness he does not mean only

a set of endangered spaces, but the capacity of all things to elude the mind’s appropriations. That tools retain a vestige of wilderness is especially evident when we think of their existence in time and eventual graduation from utility: breakdown…. In such defamiliarizations, often arranged by art, we encounter the momentary circumvention of the mind’s categories to glimpse some thing’s autonomy—its rawness, its duende, its alien being.

(21)

The designation “nature poetry” is sometimes used in the pejorative sense (as in “mere” nature poetry) in order to trivialize the content as flowery [End Page 170] and indulgent (see “Baler Twine” 25), but McKay explores much more than just animals, plants, and so-called “wild” spaces. Wilderness is present in tools and chattels, and even in the human body, the part that will respond involuntarily to sexual stimulation or hunger. Reverence for the wilderness of the other leads directly to a limitation of appropriation and to self-awareness about the limits of such a gesture. Humour and metaphor, both of which offer freer modes of thinking about the other than, say, science offers, allow the poet to develop a worldview “that considers all sentient and perceived non-sentient members in respectful partnership” (Bondar, “Attending” 76). It is not the wilderness of the other but the poet’s own inevitable limitations in encountering the other that become the butt of McKay’s jokes. The “check this out” candour and humorously unexpected list of metaphors for pebbles (for example, a “kidney stone once / passed by Apollo”) in the poem “First Philosophies” (26) are good examples of this type of purposeful play.

Furthermore, the fact that McKay leaves the borders of wilderness indefinite suggests the possibility of applying his ethics and aesthetics to the realm of human interaction. Of course, he does not advocate reducing the racial or cultural other to the level of mere wilderness, a position that would echo eighteenth- and nineteenth-century colonial discourse, but his respectful approach to otherness is naturally transferable. Mason, taking a cue from Bruno Latour, emphasizes the link between McKay’s humility toward the more-than-human and his involvement in creating a poetic and environmentally responsible human community. He argues that McKay’s poetry forces us to “slow down and pay attention to the myriad connectivities we might not be compelled to notice,” to “mak[e] connections between poetry and science, between nature and culture” (93). Put succinctly, a philosophical stance characterized by humility and deep attentiveness, and which respects the wilderness quality of the human body, cannot be limited by the subjective boundary between the human and the “more-than-human” but is also relevant in the realm of cosmopolitan exchange.

McKay calls his approach to encountering alterity “poetic attention”: “[I]t’s a sort of readiness, a species of longing which is without the desire to possess, and it does not really wish to be talked about. To me, this is a form of knowing which counters the ‘primordial grasp’ in home-making, and celebrates the wilderness of the other; it gives ontological applause” (“Baler Twine” 26). In thinking through the self’s relation to the other, McKay also makes a distinction between first- and second-order appropriation: the first is the recurrent use of natural resources, such as in fishing [End Page 171] or farming. McKay likens first-order appropriation of natural resources to Martin Heidegger’s concept of “nature [in] standing-reserve” (19), which Heidegger develops in his essay “The Question Concerning Technology” (1954). Second-order appropriation, on the other hand, is the transformation of natural resources into what McKay calls “matériel” (20), which entails a permanent usage, denying the natural other the dignity even of death, of de-and recomposition. This second form of appropriation is the worst because it denies the wilderness within the natural; it disrespects the otherness of the other. McKay urges us to minimize both forms of appropriation, even to the point of changing the way we use language so as not to “pin down” the other’s otherness.

An expected rebuttal of this approach is that all language entails appropriation and so, for that matter, does experiencing through the senses. McKay’s answer, however, offers a practical way to mitigate this negative aspect of interaction, one that can be applied in day-to-day encounters with nature and with other people or cultures. We cannot fully escape our own expectations, projections, or appropriations, but we can actively minimize them and accept our limitations, making of them “a gift from home” (31). We can also, like the poet who pushes language to near its breaking point, celebrate and embrace the unknowability of the other. Instead of attempting mastery of the other’s difference through technologies like language or machinery, we can celebrate the other’s autonomy and by stretching our categories of perception come as close as possible to understanding fully. Such humility, writes J. Scott Bryson, is one of the hallmarks of ecopoetry in general, which treats “the presence of the non-human as more than mere backdrop, [strives for] the expansion of human interest beyond humanity, [and develops] a sense of human accountability to the environment” (5).

In his essay “The Bushtits’ Nest,” McKay expands on the proper way to approach the other, stressing that it is not “sufficient simply to leave the other alone, to take a hands-off position” (96).The reason is that an active encountering “acknowledges a responsibility, a limitation of the freedom of beings in favour of the other” (97). In expounding these views, McKay acknowledges debt to Emmanuel Levinas’s thinking about the other and adapts that philosopher’s concept of “envisaging”:

So here’s how I’m reading the Face: it’s an address to the other with an acknowledgment of our human-centredness built in, a salutary and humbling reminder.....Homage is, perhaps, simply [End Page 172] appropriation with the current reversed; “here,” we say to the thing, “is a tribute from our culture.”

(“Bushtits” 99)

This theory incorporates Levinas’s thoughts on encountering the other articulated in Entre Nous: Thinking-of-the-Other (1991), but McKay takes issue with Levinas’s idea that, “in the dimension of culture opened up by knowledge, in which the human assimilates the inhuman and masters it, the meaningful is affirmed and confirmed as a return of the Same and the Other to the unity of One” (Entre 184). In McKay’s vision, we can never achieve that perfect unity (or we cannot know that we have achieved it) except in death, and instead of attempting to master the other we should celebrate the aspects that inevitably elude our appropriating grasp. He puts it another way in his interview with Babstock:

The more I got serious about being a quasi-naturalist the less happy I became with the Aeolian harp idea, you know, that nature is playing through you and translating itself into language. And the more I became a sort of crude phenomenologist, the more I had to acknowledge the separation in the act [….] and the inevitable reduction that language involves …. while still making some pretty elaborate linguistic gesture.

(171)

Unlike the Romantic poets, then, McKay does not believe in even fleeting unity with the other as appears in poems like Shelley’s “Ode to the West Wind” and Wordsworth’s “Tintern Abbey.”

The second concern of cosmopolitanism theory that McKay’s writing resolves is the need to spatially conceptualize our link to other cultures. Because it has so often been described in abstract terms, it is difficult to “feel” and therefore act upon cosmopolitan interconnection; an acceptable spatial conception is therefore of great utility in helping people to feel and understand that interconnection. Like Marx’s model of societal organization, and like the great chain of being, which had real-world encodifications in early modern Europe, a spatial concept of cosmopolitan interconnectedness would mean more than philosophy for its own sake. McKay’s Strike/Slip, in its engagement with geology and the mineral world, offers a different way to understand our bond with other cultures, a bond based upon our shared dwelling upon the earth’s crust. In the model suggested by many of these poems, all humans are linked by dwelling upon a contiguous mineral crust, from which different sorts of plants, fauna, and, ultimately, human cultures emerge (and we must include McKay’s [End Page 173] poems under this last category). Some creatures that emerge may have different abilities or dwell in more resource-rich domains, but they are still radically equal because of their origin in and dependence upon the same earth, because of their physical, elemental link to it. Moreover, unlike the Marxist base/superstructure or great chain of being models, this geological groundedness is not merely metaphorical: it is literally true and is based in hard science. Also, unlike the tenuous connections provided by travel and information technologies, it is palpable and enduring. Tectonic shift, carbon and water cycling, and evolution: these processes will outlast the human race, and because the geological model emphasizes a common origin it encourages a greater degree of humility than do the alternatives. This can help limit elitism. Scientists Lynn Margulis and Dorion Sagan underscore our commonality with the mineral: “In the universe life may be rare or even unique. But the stuff of which it is made is commonplace. More and more inert matter, over time, has literally come to life” (What Is Life? 25).The so-called hard sciences, which McKay regularly consults (see, for instance, his comments in “Ediacaran and Anthropocene” 9), are quite clear on our common physical link to the mineral world, even if they are uncomfortable philosophizing on what some call the “ontological leap” that separates humans from other animals and from non-human nature in general.

Beyond the physical connection, a much deeper cathexis vis-à-vis the mineral world, one that blurs the line between the living and the non-living, has factored in much of human history. In her essay “From Veneration to Exploitation: Human Engagement with the Mineral World” (2004), cognitive archaeologist Nicole Boivin notes that deep, even spiritual engagement with the mineral world has been central to human society since prehistoric times. She also notes that “[A]t present writing, the power of the mineral world is difficult to ignore. Current global politics are dominated by conflicts that, regardless of stated claims, often have much to do with mineral resources…. Minerals remain irrevocably linked to power, wealth and both local and global inequality” (1). She also claims that, to most contemporary Westerners, the mineral world is only thought of in terms of commodity,

but for many people around the world, minerals are alive…. People in many other societies do not necessarily recognise such a firm distinction between mineral and non-mineral, animate and inanimate. This blurring of boundaries means that minerals in many societies are attributed with qualities and [End Page 174] properties that most people in Western societies accord only to humans, animals, plants and/or the divine.

(4)

This blurring of the line between sentience and non-sentience dovetails with McKay’s definition of wilderness: whatever “elude[s] the mind’s appropriations.” In many cultures past and present, then, the concept that birds, plants, and people are emanations from the bedrock of the earth’s crust would not entail any logical impossibility due to the problem of sentience, that humans can think and rocks (as far as we know) cannot.

Our link to the mineral is literally elemental (Margulis and Sagan 24–26): in general, all life on earth is made of the same chemical elements as are the earth’s minerals and a full acceptance of that link implies an ethics. Of course, we cannot stop using natural resources altogether (which McKay freely admits in “Baler Twine”), but such a holistic view of the earth encourages greater stewardship of those resources, both living and non-living, and, by extension, greater social responsibility. In other words, to pollute a river or to contaminate bedrock with deposits of nuclear waste implies maltreatment of others because of humanity’s physical link to the mineral. This common link also encourages us to see that the right to exploit resources is shared by all communities, regardless of their expertise or means of production. The world’s oil and ore, to take two currently important examples, are the inheritance of more than just those who can finance a refinery or a mining operation. The ethics of our interactions with the mineral, animal, and human realms, in other words, cannot be disentangled.

McKay only tentatively suggests the sentience of the mineral, but when he encounters the other, including the geological other, he wonders, “Are we not right to sense, in such meetings, that envisaging flows both ways?” (“Bushtits” 101). And again, in the poem “Après Chainsaw” (Strike 50), the human observer senses “everything listening at me” in the quiet pause after cutting down some trees (1; emphasis added). Yet how best should we give shape to this experience of communion with wilderness? Boivin claims that we “need to address alternative conceptualizations of the mineral world. As industrial capitalism relentlessly pursues the discovery and exploitation of ever more mineral and other natural resources, contrasting perspectives on the mineral world are brought into increasingly sharp focus” (20).There is a call, therefore, in both the fields of cognitive archaeology and cosmopolitanism for a new way to think about our interaction with the natural environment and consequently with each other. The model suggested by McKay’s Strike/Slip is just such an alternative that encourages [End Page 175] a more reverent and thoughtful approach to the mineral world and to the people with whom we share it.

Yet, such a modeling of our interconnectivity presents challenges. One reason why theorists have been reluctant to give a fully articulated spatial conception of cosmopolitan interconnectivity is the difficulty of fitting a permanent model to a phenomenon that appears so kinetic and ever changing. Would a model not become obsolete with every major leap in communications technology, for instance? Thus, many theorists have proposed nothing sturdier than a floating, indistinct sense of connectedness, densities of overlapping allegiance, or what Featherstone terms “the relational matrix of …. significant others” (112). Many of these conceptions recall Benedict Anderson’s imagined community but are concerned primarily with interactions across nations.

Scholars such as Gilroy challenge any spatial model that places an elite class of thinkers and artists at a god-like vantage, which would recall the spatial paradigms current in eighteenth-century English civic humanism. In such a model, the elite are symbolically above the common rabble, can communicate with other elites, and the wisdom gained trickles down. The model is traceable to the hierarchical organization of the great chain of being, yet “the universality that comes into view from the cosmic angle,” Gilroy writes, “must submit to the stern ethical tests” of practice (74). downward gaze of the elite interpreter and knowledge-producer, which has been invoked in numerous cosmopolitan discussions, seems to destroy the very equality and mutual respect that cosmopolitanism should strive to achieve. Of course, it is easier to critique a model than to suggest a better one. Featherstone, for instance, concedes that, “important as the drive for deconceptualization is, there remains the problem of reconceptualization, the possibility of the construction of higher-level, more abstract general models of the globe” (123).The fact that he identifies the superior model as “higher-level” indicates just how difficult it is to escape the hierarchical, top-down conception of cosmopolitanism.

Space exploration creates a planetary consciousness – cultures realize their interconnectedness and the fragility of the world

Ferguson 09 – Jesse Patrick Ferguson – a doctoral candidate in the Department of English at the University of New Brunswick, June/Sept 2009, “Rocking Cosmopolitanism: Don McKay, Strike/Slip, and the Implications of Geology,” <http://muse.jhu.edu/journals/esc_english_studies_in_canada/v035/35.2-3.ferguson.html#back>

After much deliberation, Gilroy suggests a model that in some ways approximates the vision that emerges from *Strike/Slip.* Following the Copernican revolution and the advent of earth photographs taken from outer space, humans have developed a radically different, humbler sense of identity. Especially in the context of the environmental crisis of the twentieth and twenty-first centuries, diverse cultures are slowly awakening to their interconnectedness. Gilroy calls this “postmodern planetary consciousness,” which **[End Page 176]**

relies on a reimagining of the world which is as extensive and profound as any of the revolutionary changes in the perception and representation of space and matter that preceded it. The world becomes not a limitless globe, but a small, fragile, and finite place [….] with strictly limited resources that are allocated unequally.(75)

This is certainly not the trifling cosmopolitanism of the aesthete but “a planetary consciousness of the tragedy, frailty, and brevity of indivisible human existence that is all the more valuable as a result of its openness to the damage done by racisms” (75). Though Gilroy does not explicitly identify humanity’s common tie to geology as the source of this communal vision, his idea that the fate of everyone depends upon the health of the planet dovetails with the geological spatial model that emerges from *Strike/ Slip.* Key to both conceptions is from what direction the cosmopolitan impulse originates: Does it emerge spontaneously from common people bonded through a connection to the earth, through education, activism, and art (such as McKay’s poetry), or is it imposed in a top-down fashion, by transnational corporations or governing bodies, for instance? former direction of influence is superior because it limits elitism and because it does not reduce the cosmopolitan impulse to consumerism.

Turning now to specific examples, we find that almost every poem in Strike/Slip invokes the mineral world in some way. Many are informal odes or lyrical explorations of our experiences of rock and the implications of geological time for our brief lives, a time scale that McKay claims “requires a stretch of the imagination, […] the supreme stretch test” (“Otherwise Than Place” 16). Certainly, the imaginative possibilities inherent in geology emerge in McKay’s earlier work: “Drinking Lake Superior” (1987) and “On Leaving” (2000), for instance, wrangle with similar material, as does “High Noon on the Pre-Cambrian Shield” (1983), in which the poet-speaker dwells on “granite, the last word” (Birding 110). However, McKay’s tenth full collection, as announced by its geological title, delivers his most sustained and intensive interaction with the mineral world and the time scales appropriate to it, a shift in McKay’s focus also identified by Dickinson in his review of Strike/Slip. Even the first edition’s cover, which is dominated by McKay’s photograph of grey rock, gives pride of place to the mineral and suggests that even sophisticated cultural artifacts like poetry are rooted in rock.

It is worth noting that many of the poems in this collection exhibit cosmopolitan tendencies in more ways than one; besides suggesting a model for human interconnection, they also allude explicitly to other [End Page 177] cultures. For a self-proclaimed nature poet, McKay spends much of his time invoking diverse human artifacts. “Quartz Crystal” (15), for instance, invokes Johann Sebastian Bach, several musical forms, Pythagoras, and Zen Buddhism. “Pine Siskins” (64) employs three languages, references American composer Charles Ives, and carries the reader to Scandinavia with the humorous lines “as chez soi as Danes / eating danishes in Denmark” (3–4). Again, the playful tone of these inclusions complicates any generalizations about the poet’s intentions, but we must recall that play and the stretching of language and logic—as in what Bushell calls McKay’s “high tension metaphor” (66)—allow the poet to approach the other in full admission of the appropriations and limitations inherent in language. Such humorous overtures, argues Méira Cook, are not about mocking the difference of the other; they seek instead to “forg[e] a fertile negotiation with otherness” (xiv). Moreover, the products of other cultures, be they religious or artistic, offer the poet the means to push the reader’s mind further, to stretch the imagination through high-tension metaphor, by means of which, Bushell argues, McKay “stretches language in an attempt to express some aspect of an extra-linguistic realm he refers to as ‘wilderness’” (60). When the poet-speaker likens pine siskins to Danes in Denmark, the reader must accommodate the great distance between what is reductively called the metaphor’s vehicle and tenor, must enter the receptive state of poetic attention.

The poems that deal with the mineral world suggest a model of existence in which even virtuosi like Bach share a common source with all other animate and inanimate existence. The cultural practices and products that have sometimes divided people are revealed as radically connected; these poems rock cosmopolitanism, exposing the enduring link between us all. Moreover, in many cases the poems dramatize the physical process by which animal, plant, human, and cultural artifact emanate from the mineral. And yet, whether the poet expresses this link through subtle word choice or a more direct statement, there is no didactic finger wagging here; instead, through humour, temporal play, and metaphorical virtuosity, McKay makes the reader see and feel the connection to rock and, by extension, to all other life.

Though examples in the collection are plenty, just a few are necessary to illustrate how the poems develop the spatial conception. “Precambrian Shield” (8), for instance, traces the poet-speaker’s thoughts as he considers the origins of the geological formation also known as the Canadian or Laurentian Shield. Alternating between a meditative and a more playful tone, the poem then shifts focus to a remembered wilderness encounter [End Page 178] experienced by the speaker and (presumably) one friend. Finally, the speaker returns to the meditative approach, imaginatively entering a Tom Thomson painting, possibly the famous Bateaux composition. Precambrian Shield, described by the poet as both “ancient and young, oldest / bone of the planet” (1–2), is indeed the first part of North America to permanently emerge from the prehistoric seas. It is therefore a potent embodiment of geological longevity.

From its first lines, the poem invokes time scales beyond human comprehension. The clownish poet figure cannot fathom the astronomical age of the Shield and instead reduces it to just one week. The dignity of the geological formation contrasts sharply with the foolishness of the younger version of the poet-speaker. In the poem’s present he concedes that his earlier self and his friend(s)

were muscle loving muscle, drank

straight from the rivers ran the rapids threw

our axes at the trees rode the back of every moose

we caught mid-crossing put our campfires out

by pissing on the flames.

(20–24)

It is significant that the young people depicted in the poem are irreverent and inattentive toward the wilderness that surrounds them. Their impetuosity is underscored by the pace created by the strategic absence of punctuation in the passage. They throw their axes at trees, symbolically participating in the exploitative history of logging; they (presumably in imagination) appropriate the moose as a form of transportation; and they piss on their fire, which entails pissing on both the fuel (wood) and pit (rock). Surely this passage is humorous, but the humour points to the ridiculousness of unthinking, commodifying attitudes to the other. But perhaps most egregious of these lapses is the characters’ remembered inattentiveness. They were surrounded by sublime beauty, and yet they were so preoccupied with themselves that the speaker is left wondering, “Did we even notice / that the red pine sprang directly from the rock[?]” (17–18). Not only are these young people incapable of McKay’s sophisticated poetic attention, they are also incapable of the less-preferable Romantic gaze or even the sober gaze of the materialist.

The reader of “Precambrian Shield” is not alone in recognizing this tomfoolery. The poem’s speaker asks himself twice, “Would I go back to that time?” (9, 32–33), ostensibly referring to the escapades he and his [End Page 179] friend had navigating the “curious and cold” lakes but also referring to the mindset he once had. Like the speaker of Wordsworth’s “Ode: Intimations of Immortality,” who indulges in nostalgia but ultimately praises the perspective of maturity, McKay’s speaker has come to a deeper appreciation of wilderness (though he is much less assertive than Wordsworth in translating his experience).The poet-speaker’s growth is evidenced by the tonal disparity between passages imaginatively engaging with the Precambrian Shield and those in the narrative passages that catalogue past actions. The poet who imaginatively plumbs the “transparent / unintelligible depths” (37–38) of the lakes is certainly in a more reverent relationship with wilderness than the muscle-loving youth who pisses out his fire. The ability to dwell within unintelligibility recalls McKay’s essay “Otherwise Than Place,” in which he encourages the attempt at non-appropriative, pre-rational intercourse with nature. The difference between past and present approaches to wilderness in “Precambrian Shield” is made doubly clear when the poet-speaker paradoxically proclaims that he and his friend(s) had “the wit to be immortal / and ephemeral” (28–29).The paradox is resolved, however, if we consider that the new sense of ephemerality is likely applied in retrospect, with the younger self maintaining delusional intimations of immortality.

The poem’s suggestion is that only the Shield is immortal, and that people, moose, trees, and lakes all emerge from and return to it. Tom Thomson, because of his great artistic talent, could easily be placed on a cosmopolitan pedestal, above the poem’s speaker, but Thomson too emerges from the mineral world and ultimately returns to it. Like the speaker, who dreams of diving for Thomson’s body, we all will eventually fall into the “chaste and dangerous embrace” (10) of the “watching” (36) wilderness. Terms like “sediment ... accumulated,” “sprang directly from the rock” (emphasis added), “diving,” “surfacing,” and “plunging” suggest the rise and fall of natural cycles, which eventually subsume and regenerate the human. Yet, the poem’s tone is not one of despair. Rather, there is a sense of propriety, even of pride in returning to the mineral world; there is the humility of poetic attention.

“First Philosophies” (26) develops a similar contrast between the ephemerality of humanity and the relative permanence of geology. As does Descartes in the treatise from which this poem’s title is taken, McKay’s speaker attempts to reduce all reality to first principles, to bedrock. In so doing, he decides first that “everything derives from air” (7), then fire, and finally (perhaps unsurprisingly) rock. As in “Precambrian Shield,” the [End Page 180] speaker here revises earlier, false conceptions of wilderness, arriving finally at this conclusion:

I realize that, yes,

everything derives from rock, rock that,

under these soft auspices,

suffers the insufferable ocean.

(23–27)

The cosmogony developed throughout this poem is destabilized by humorous elements, such as the metaphor comparing a pebble to Apollo’s kidney stone and the poet-speaker’s candid expression of wonder in “check this out” (21). “First Philosophies,” however, ends on a more serious and contemplative note, and (as in McKay’s earlier poem, “High Noon on the Pre-Cambrian Shield”) rock is given “the last word” (Birding 110), albeit as necessarily mediated by the poet-speaker. The vision of wilderness developed in this poem emphasizes that we are not just linked to the mineral world but that we share a common origin in it. The kinglets and Sitka spruce may have different attributes, but they depend upon the same natural cycles of mineral resources. In the same way, all humans share a common origin in and must dwell together upon the bedrock of the earth. The final physical gesture of the poet, that of returning the stone in his hand to the sea—“I toss it, thoughtfully, / back to the surf” (23–24)— physically represents unending natural cycles. The rock begins on shore, is picked up by the poet, considered (becomes stone), and is then thrown into the sea, presumably to wash up once more. The humour developed in this and other poems, far from discrediting the claim that “everything derives from rock,” serves to open readers’ minds to “options for living in a suspended state of provisionality or contingency” (Forster 109). In other words, McKay’s humour, like his metaphor (see Dickinson and Bushell), allows us to conceive of our relationship to non-human nature in a way that accepts the ambiguities that the hard sciences seek to explain away.

The prose poem/mini-essay “Gneiss” (38–39) is uncharacteristically concerned with human affairs, and may therefore appear exceptional to the aesthetics and ethics of Strike/Slip. It begins and ends in explicit engagement with human culture—and in a non-Canadian country, no less—opening with an epigraph from a Scottish travel guide and closing with an abrupt shift inviting the reader to join the speaker in touristic contemplation: “Better stop here. Better spend some time” (39), an invitation which ironically aligns the speaker with the tour-guide writer’s more superficial engagement with the landmark. The poet-speaker contemplates [End Page 181] the construction of a circle of standing stones by Neolithic humans, who wished (he assumes) to attain commiseration with the land’s forbidding geology—“that some of the rocks that comprised their island should stand up with them against the levelling wind and eroding rain” (38), that rock itself would figuratively and literally bear with them the vicissitudes of a harsh climate.

In spite of its focus on ancient stoneworker and twenty-first-century tourist cultures, “Gneiss” bolsters the claim for the geological basis of human connection and cosmopolitanism. By dramatizing the physical conversion of rock to cultural artifact—“they insisted that rock be stone”—McKay provides a more concrete example of how the stuff of cosmopolitanism ultimately emerges (in this case literally rising up) from the geological. Indeed, the piece is peppered by language that suggests physical rising: “should stand up,” “getting up,” “levered into the air.” The poem meditates on the way Neolithic humans reproduced their own image in rock and were left “reading the earth-energy they had levered into the air,” and, millennia later, the tourist is left pondering the gesture at a further remove. In other words, the stone circle is no different in kind from the other cultural items mentioned in the prose poem/essay: the fugue, automobiles, high school, Münch’s The Scream, or the piece of writing called “Gneiss” itself. The only difference is the directness of their link to geology. Moreover, the image of the stones standing with and like the stone-age builders and the image of one builder running a reverent hand over one of the stones—“whorled fingertip to gnarled rock”—suggest the radical unity of the human and the mineral, an idea made explicit in other poems from the collection such as “Petrified”: “You are the momentary mind of rock” (4).

This radical, physical connection to geology, of course, allows for respecting the wilderness of the non-human, that “capacity of all things to elude the mind’s appropriations” (“Baler Twine” 21). Science can tell us that our bodies share common elements with the mineral crust, but it cannot tell us the ethical or aesthetic significance of that fact. McKay’s poet-speakers constantly encounter the limitations of human understanding vis-à-vis non-human nature, but, as McKay makes clear in his essays, we must embrace those limitations to our understanding (see “Baler Twine,” for instance). Humanity’s radical connection to geology is not contingent on its complete understanding of that connection any more than an infant’s need to breathe, drink, or eat is contingent on an understanding of cellular biology. Our attempts to encounter the “real” stone circle will always be mediated by human language and concepts, which in “Gneiss” [End Page 182] are suggested by a catalogue of cultural artifacts (for example, Münch’s painting, the weather network, the travel guide), but we must accept our failure to fully understand, while remaining open to the radical connection we can never hope to adequately articulate. The stone circle of “Gneiss,” then, is indeed “the circle of connection” (38), but one that gently mocks our ability to fully express that connection.

The terminal sequence of Strike/Slip, “Some Last Requests” (71–72), also gives rock the last word, and like “Precambrian Shield” it invokes death but takes solace in the endurance of wilderness and in our return to it. Key to this diptych is the distinction, developed throughout the collection, between stone and rock. While rock is the mineral substance in its natural, untouched state, involved in cycles of erosion, stone is rock put to use, appropriated by the mind, thought-thickened. Thus, Apollo’s kidney stone in “First Philosophies” is indeed stone, as is the tombstone evoked in the first poem, “Of stone,” of this diptych. The poem acknowledges the needfulness, and indeed the joy, of appropriating nature for the purpose of home building (an idea McKay develops in “Baler Twine”) so long as the wilderness of the other is respected and accepted. When taking is taken too far, as in what McKay calls second-order appropriation, the natural other is denied all wilderness, is abstracted from natural cycles; it becomes mere “matériel.” McKay gives the nuclear test site as example for this second type of appropriation: the bombsite is no longer natural; it is reduced to a mere sign of the bomb-maker’s power. Another example of second-order appropriation could be a tombstone, which we hope will forever remain the signpost to our final “house.”

If “Some Last Requests: Of Stone” is the poet’s last will and testament, then we find him grasping at wilderness until the end. The piece begins with the request “that oblivion be tempered / with remembrance and the limestone step be worn” (1–2). This homely vision would indeed be a comfort to the dying: that a life lived would leave a mark. This desire is made clearer when the speaker begs his tombstone to “carry my name a little further on / / till it gets past missing me” (8–9). As occurs in so many of McKay’s poems, the poet here explores the ineffectiveness of language. The speaker’s name stands in synecdochically for all language, which he is attached to but ultimately attempts to relinquish. At last, language is dismantled and fed, “phoneme by phoneme, / / to the hawk scream it so badly mimicked / with its last long I” (12–14).The link between language and egocentrism is emphasized by the speaker’s name’s last word—“I.” Therefore, though the poem is ostensibly an apostrophe to stone, the [End Page 183] true addressee seems to be the wilderness that remains in the stone, its indelible “rockness.”

The second half of the diptych, “Of rock” (72), collects many of the preoccupations of Strike/Slip and leaves rock and wilderness, finally, in the reader’s mind. The playfulness here is not as pronounced as in some of the collection’s earlier poems, but it remains in order to emphasize that the speaker’s inevitable return to the cycles of wilderness is not something to be feared but is presumably a release from pain and estrangement. The poem begins with a question that recalls “Of stone”:

that you teach me, as they say,

(insincerely) in the love songs,

to forget.

That my words should kiss

their complex personalities goodbye and sink

into Loss Creek.

(1–6)

Again, the speaker seeks to transcend the limitations and appropriations of language. Even more explicitly anticipating the dissolution of the ego, he asks that his “thoughts / …. fray into the weathers they have long / loved from afar” (11–13), and the subtle pun on weather/whether suggests the provisionality of the speaker’s relationship to death. Strike/Slip teaches that everything comes from rock, and in this last poem of the collection everything returns to rock. Yet, this is not a cause for lament; there is indeed a bittersweet quality to the apostrophe, but there is also a sense of anxiousness for unity with wilderness, for being without the need of even open-handed appropriation.

This manner of approaching otherness suggests the possibility of a cosmopolitanism of respect, self-awareness, and equality. If we approach problems of multiculturalism with the same open-handedness, informed by our common mineral origin, then many conflicts could be avoided. Moreover, this geological model of cosmopolitanism encourages stewardship of the earth, a practice that benefits both it and the people who inhabit it. Admittedly, the view developed in McKay’s poetry would need more systematic working out before it could offer realistic solutions to many of the problems plaguing the global community. And, unfortunately, simply knowing that we are connected in the mineral world does not force anyone [End Page 184] to change his or her negative behaviours, as the recent unheeded chorus of warnings about climate change should make clear. But, as Sir Philip Sidney reasoned in The Defense of Poesy (1595), where the philosopher’s dry dogmatism fails to mobilize virtuous action, the artist’s creative work can dramatize issues, to make us feel, then hopefully to act on those feelings. spatial conception that emerges from McKay’s Strike/Slip, therefore, combined with his ethics of encountering the other developed especially in his essays, gives us both feeling and dogma and offers a solid foundation upon which to base further cosmopolitan thought and action.

When we went out to space, the thing we were most interested in was Earth – that’s not imperialist

Peterson 11 – Stephen Peterson - teaches courses in the history of modern and contemporary art at both the University of Delaware and the University of Pennsylvania; Robert Poole – author of Earthrise - reader in history, University of Cumbria, February 2011, “Earthrise: How Man First Saw the Earth by Robert Poole,” Vol 44 Number 1, <http://muse.jhu.edu/journals/leonardo/v044/44.1.petersen.html>

Earthrise has a simple thesis with profound consequences: What the Apollo astronauts discovered when they got to the Moon was, in fact, the planet Earth as they saw it from afar. Their photographs of the Earth in space transformed humanity's idea of itself and of its home planet. No longer was the whole Earth a projection or an **[End Page 81]** abstraction; human eyes had seen it, a sight epitomized in a handful of widely reproduced images that are here put into cultural context.

The author is a historian of early modern England who by his own admission is stepping "outside" his "accustomed fields." The result is a refreshingly wide-ranging history with a perhaps unlikely focus, namely the link between the Apollo space project and the back-to-nature counterculture that blossomed in the very same years. Calling itself "an alternative history of the space age," this book resists the typically triumphalist narrative of spatial conquest (as well as the dismissive view, often from the left, of space exploration as an expensive technocratic folly) in favor of a nuanced exploration of the rhetoric and imagery that accompanied the Apollo project. Focusing on the brief era of extra-orbital manned flight from 1968 to 1972, Poole maintains it is no coincidence that these years saw the emergence of the modern environmental movement. The defining moment of the book (and, the author argues, of the U.S. space program and indeed of the entire 20th century) is not Neil Armstrong's first step on the Moon during the *Apollo 11* mission but rather the vision from the Apollo 8 Lunar Orbiter, some months before, of the Earth appearing from behind the lunar horizon. Shrouded in a religious aura (it happened on Christmas Eve 1968), the image of "Earthrise" was, ironically, a nod to pre-Copernican thought. Earth was, once again, the center of the universe.

Recounting the conflicting views of astrofuturists, who believed the destiny of humanity was in space, and environmentalists, who saw outer space as a flight from earthly concerns, Poole steps back to show the connection between the two. In its sequence of photographs of the whole Earth, Apollo (along with other NASA projects) effectively provided an imagery for the environmental movement. Moreover, an impetus for the first photographs of Earth from space seems to have come from countercultural figure Stuart Brand, who in 1967 demanded to know, in a public relations effort, "Why haven't we seen a photograph of the whole Earth yet?" (a notion he had while tripping on LSD and perceiving the Earth's subtly bulging horizon from a San Francisco rooftop). In turn, the first color whole-Earth image, taken by satellite ATS-III in 1968, would adorn the cover of Brand's inaugural *Whole Earth Catalogue*, known to some as the bible of the counterculture.

Brand was a follower of Buckminster Fuller, whose notion of "Spaceship Earth" as a self-contained system informed ecological awareness (the first Earth Day flag bore an image of Earth from space). In the wake of the Earthrise photograph, however, the technological metaphor of Spaceship Earth was superceded by James Lovelock's "Gaia"—Earth as a living organism—which would find its ideal representation in the Apollo 17 "Blue Marble" photograph of 1972. This widely reproduced image from the last Apollo mission was, writes Poole, "an abstract composition in blue and white . . . more like an impressionist painting, with . . . the deeper mysteries of nature displayed in a hypnotic blob of color" (p. 95). An image of a living Earth leads directly to the global warming science and politics of today.

As a historian dealing principally with images, Poole perhaps wisely steers clear of contemporary photographic theory. But he clearly describes the different photographic techniques and attends to the photographs' multiple channels of transmission. The book gives a vivid sense of how the particular images were made, how they were disseminated and how they were received. It re-creates the circumstances of the taking of specific photographs, connecting them to their "authors" in interesting ways. An unsung hero in the largely unknown photographic history recounted by Poole is Richard Underwood, Apollo director of photography. Underwood encouraged and provided detailed logistical support for the particular views that were ultimately produced. Even though the Apollo astronauts were not always encouraged to (or scheduled to) look at the Earth or photograph it, they managed to do so anyway. On their return, they spoke most passionately of the effect not of space or the lunar landscape, but of the view back to Earth. Especially affected was Apollo 9 astronaut Rusty Schweickart, who would become involved with the emerging New Age spirituality and planetary consciousness movements of the 1970s, providing perhaps the most direct link between NASA and the counterculture.

If, as Poole suggests, the astrofuturists now appear to have jumped the gun, given the finite span of the Apollo project and the uncertain prospects for out-of-orbit space travel in the near future, the unique challenge of maintaining our Earth's biosphere looms ever larger. The very notion of an Earth at risk derives from—and adds a poignant coda to—the whole Earth awareness of the Apollo era. **[End Page 82]**

The perspective from space makes us realize our cosmic insignificance and set aside our differences

Allton 92 – JH Allton – works for The SAO/NASA Astrophysics Data System, “The Lunar "Community Church": Contributions to Lunar Living and to Evolution of Ethical and Spiritual Thinking,” The Second Conference on Lunar Bases and Space Activities of the 21st Century, Proceedings from a conference held in Houston, TX, April 5-7, 1988. Edited by W. W. Mendell, NASA Conference Publication 3166, 1992., p.703, <http://adsabs.harvard.edu/full/1992lbsa.conf..703A>

Viewing the Earth from far above its surface has affected the way some space travelers feel about world peace, pollution, relationships with other people, and God (or gods). Changes in perception of "our world" and interactions among its inhabitants, due to the visual and emotional impact of seeing the Earth from farther away, perhaps entirely in the field of view, have been termed the "overview effect" by White (1987).

Past Space-Related Experience

This change in perception is evidenced in the oft repealed astronaut wish that the warring peoples could also see this view from space, for then surely they would sec the insignificance of their differences. Another example comes from Russell Schweick-art who, while viewing the rotating Earth beneath him, first identified "home" with Houston. As the orbiting continued, his concept of home enlarged to include Los Angeles, Phoenix, New Orleans, North Africa, and then, finally, the entire Earth. Apollo astronauts Edgar Mitchell, through his Institute for Noetic Sciences, and Russell Schweickart, through the Association of Space Explorers, both feel a responsibility to articulate the space flight experience so that many can share it ( White, 1987).

Space exploration opened our eyes to the threat of environmental destruction which caused a massive environmental movement

Daly and Frodeman 08 - Erin Moore Daly – graduate student in the School of Life Sciences and the Center for Science, Policy, and Outcomes at Arizona State University; Robert Frodeman – chair of the Department of Philosophy at the University of North Texas, specializes in environmental philosophy and philosophy and science policy, Spring 08, “Separated at Birth, Signs of Rapprochement Environmental Ethics and Space Exploration,” <http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html#back>

During the period in which humans first entered space, walked on the **[End Page 135]** Moon, and extended the range of human existence beyond the Earth, we began to pay attention to the habitability of our terrestrial home. The first images taken from space by the U.S. Weather Bureau's TRIOS satellite launched in 1960 showed a "pale blue dot" floating in a vast darkness ([Sagan 1994](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html%22%20%5Cl%20%22b29)). Worldwide, these images unleashed a wide range of remarks—on the Earth's fragility, insignificance, or magnificence, its stunning geographical features, and the non-existence of visible national boundaries.

While this cultural reflection was taking place, the community of professional philosophers was closeted in arcane debates. Since Dewey's death in 1952, the profession had overwhelmingly become a disciplinary domain whose research was written by and for philosophic experts. But despite the silence of philosophers (including environmental philosophers) on the subject, there is in fact a powerful link between our exploration of space, the reflections it elicits concerning the fate of our home planet, and the development of environmental ethics. This essay explores these connections, arguing that our thinking about both the future habitability of the planet ethics and the exploration of space is sharpened by bringing the two into more explicit contact.

A Lost Relation

As with our explorations of the extraterrestrial realm, the first reflections on the state of the planet were prompted by the work of scientists rather than philosophers or humanists. US Fish and Wildlife zoologist Rachel Carson's *Silent Spring* (1962) and Stanford University entomologist Paul Ehrlich's *The Population Bomb* (1968) highlighted concerns that came to nationwide expression in the first Earth Day in 1970—the year after the scientific, technological, and political triumph of the first landing on the Moon. The books shared a common rhetoric—ethical *cri de coeur* built on the supposedly objective foundation of science. For instance, Carson's claim that the effects of DDT radiated throughout the environment causing reproductive problems and death was quickly taken up as an argument for viewing nature as a web of life we needed to nurture and protect.

Professional philosophers were slow to catch up—environmental ethics did not become part of any university's curriculum until the 1970s, **[End Page 136]** when it was first taught by J. Baird Callicott at the University of Wisconsin, Stevens Point in 1971. The field did not gain a real foothold within academia until the 1980s. Even now, environmental ethics remains a stepchild of philosophy not meriting a category within the Leiter Report. It is marginal within the bulk of programs and departments.

But while space exploration may have contributed to the birth of environmental consciousness—giving us a new, more global perspective on our home—and environmental ethics, environmental ethics itself has paid little attention to the philosophical dimensions of space exploration or to the relation between the sub- and superlunary spheres. Even the scientific discovery of the importance of asteroid impacts in Earth's history (c. 1981) and the imminent impact of global climate change have done little to encourage reflection on Earth within an extraterrestrial context.[1](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html%22%20%5Cl%20%22f1) Of course, humans have long populated the heavens with spirits, and theologians and philosophers such as St. Thomas Aquinas (d. 1274) and Giordano Bruno (d. 1600) considered the possibility of extraterrestrial rational intellects. But before the launching of Sputnik in 1957, philosophic consideration of space was lodged within the science fiction literature of H.G. Wells, Jules Verne, Ray Bradbury, Arthur C. Clarke, and others.

Within philosophy a small number of scholars extended their concerns to include outer space. Eugene Hargrove's edited volume, *Beyond Spaceship Earth: Environmental Ethics and the Solar System* (1986), was the first and remains the best effort at thinking about the philosophical issues regarding humans' use of and relationship to outer space. Philosophers Robert Ginsberg (1972), William K. Hartmann (1984), Donald Scherer (1982), and Lewis Beck White (1998) also published on these topics from the early years of space exploration. But this literature is still limited, both in terms of scope and frequency of publication.[2](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html%22%20%5Cl%20%22f2) Part of the problem may lie in the fact that sublunary environmental ethics had difficulty in gaining the attention of mainstream academic philosophers. But environmental ethics itself has been limited by its focus on *ethics*rather than philosophy.

The distinction is an important one. By the mid 19th century, science had attained the status of being our only reliable source of knowledge. Art, metaphysics, and religion were dismissed as unverifiable expressions [End Page 137] of subjective belief. Because of its clear practical import, ethics was partially exempt from this dismissal. While some 20th century philosophers (e.g., [Stevenson, 1963](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html%22%20%5Cl%20%22b33)) and much of the public came to view ethics as consisting of mere manifestations of emotion, society was not willing to abandon all substantive ethical claims. When questions of the state of the environment came to the public's attention in the 1960s, people seeking to express their moral views used science to buttress their ethical claims—for instance, arguing for the preservation of the Pacific Yew tree because of the usefulness of Taxol as a cancer drug. Professional ethicists, sharing the prejudices of the age, were left trying to adapt their established ethical theories to these new topics. The resulting efforts at "ethical extensionism" sought to stretch ethical theories developed for humans to animals, plants, and ecosystems.

By the early 1990s, the twin assumptions that our valuing of nature is solely a matter of ethics, and that our ethical claims must be grounded in science, were ready for reevaluation. The development of environmental *philosophy* (a new traditionalism, in that it looked back to the pre 19th century categories of natural philosophy and cosmology) is increasingly giving epistemological, aesthetic, religious, and metaphysical concerns about nature equal status with ethics.[3](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html%22%20%5Cl%20%22f3) The wider range of environmental philosophy is better situated to describe our interests and experiences at places such as the Grand Canyon. People go to the Grand Canyon for reasons of aesthetics (its beauty), theology (the awe it inspires), or metaphysics (it gives us a new sense of one's place in the universe), not ethics. Moreover, the wider concerns of environmental philosophy are more consistent with our responses to and concerns with the extraterrestrial realm. While issues such as the possible biological contamination of other planets and space debris have clear ethical dimensions, the expansion of our understanding of the cosmos through instruments such as the Hubble Space Telescope is much more a matter of aesthetics (e.g., Hubble's stunning pictures) and metaphysics (our growing appreciation of the long view of cosmic history) than ethics. Humans tend to acknowledge ethical responsibilities to what is close at hand. The thought of environmental ethics in outer space, where few will go in our lifetimes and nothing is known to live, is quite simply unfathomable to most. But despite all this, the cosmic environment continues to awe, delight, and inspire generation after generation. **[End Page 138]**

In what follows we seek to spur the rapprochement and cross-fertilization of philosophy and space policy by highlighting the philosophic dimensions of space exploration, pulling together issues and authors that have had insufficient contact with one another. We do so by offering an account of three topics: planetary exploration, planetary protection and the search for extraterrestrial life, and terraforming. The resulting synthesis seeks to change our thinking about earthbound environmental ethics as it considers the philosophical dimensions of space exploration, and introduces the possible benefits of a humanities-oriented approach to space policy.

Planetary Exploration

Lessons learned about our impact on the Earth's surface and atmosphere have relevance as we travel beyond our home planet. The unintended and often destructive effects of humankind on the Earth environment highlight the need for caution and restraint as we travel beyond our home planet. Several authors, acknowledging the probability that humans will one day be active and constant presences in space, have suggested the need to identify and preserve wilderness areas on celestial and planetary bodies.[4](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html%22%20%5Cl%20%22f4)Using the United States National Parks System as an analogue, scientists Charles Cockell and Gerda Horneck (2004) suggest that an extraterrestrial park system with strict regulations and enforcement measures would go a long way to ensure that portions of Mars remain pristine for science, native biota (if any exist), and human appreciation. Such a policy would acknowledge the competing interests and priorities of many parties: national space agencies, the international community, the community of space scientists, private enterprises who have fixed their sights on space tourism, commercial, and/or industrial enterprises in space, environmental ethicists, and the general public.

The issues involved are complex. National Parks in the United States were established after centuries of thinking through the relationships between human and nonhuman, nature and culture, beauty, truth, and the sublime, and humans' obligations toward the Earth. Scientists and political decision-makers will have to confront these issues, whether explicitly or implicitly, as they consider the future of the space program. But this thinking will now take place in a context where humans are aliens. Earth-bound environmental philosophy occurs in a context where we are a **[End Page 139]** natural part of the environment. On other planets we face a new first question: what are the ethical and philosophical dimensions of visiting or settling other planets? In short, should we go there at all?

To date, the discussion of natural places has turned on questions concerning intrinsic and instrumental values. Intrinsic values theorists claim that things have value for their own sake, in contrast to theories of instrumental value where things are good because they can be used to obtain something else of value (economic or otherwise). This debates tends tend to get caught up in attempts at extending the sphere of intrinsically valuable entities. Ethical extensionism depends on human definitions of moral considerability, which typically stem from some degree of identification with things outside us.

This anthropocentric and geocentric environmental perspective shows cracks when we try to extend it to the cosmic environment. The few national or international policies currently in place that mention the environment of outer space (e.g. NASA's planetary protection policy, United Nations Committee on the Peaceful Uses of Outer Space) consider the preservation of planetary bodies for science, human exploration, and possible future habitation, but there is not yet any policy that considers whether these anthropocentric priorities should supersede the preservation of possible indigenous extraterrestrial life, or the environmental or geological integrity of the extraterrestrial environment.

Anticipating the need for policy decisions regarding space exploration, Mark Lupisella and John Logsdon suggest the possibility of a cosmocentric ethic, "one which (1) places the universe at the center, or establishes the universe as the priority in a value system, (2) appeals to something characteristic of the universe (physical and/or metaphysical) which might then (3) provide a justification of value, presumably intrinsic value, and (4) allow for reasonably objective measurement of value" ([Lupisella & Logsdon 1997, 1](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html%22%20%5Cl%20%22b20)). The authors discuss the need to establish policies for pre-detection and post-detection of life on Mars, and suggest that a cosmocentric ethic would provide a justification for a conservative approach to space exploration and science—conservative in the sense of considering possible impacts before we act.[5](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html%22%20%5Cl%20%22f5) A Copernican shift in consciousness, from regarding the Earth as the center of the universe to one of it being the home of participants in a cosmic story, is necessary in order to achieve the proper environmental perspective as we venture beyond our home planet. [End Page 140]

Of course, given current and prospective space technology, our range is quite limited. The current Pluto New Horizons probe, launched by NASA in January 2006, travels at 50,000 mph, the limit of chemical propulsion. At such speeds Pluto is nine years distant, Alpha Centauri 55,000. On the other hand, there are perhaps 1000 near Earth asteroids greater than 100 meters—not counting those in the Asteroid Belt beyond Mars—with a frequency of impact of perhaps one in a hundred years that would cause a regional scale disaster.

Planetary Protection and the Search For Extraterrestrial Life

Since the beginning of the U.S. space program, NASA has taken care with the question of possible contamination—whether so-called forward contamination of space from Earth, or back contamination of Earth from hitchhiker organisms (NASA 1999). In 1958 the International Council of Science (ICSU) established the Committee on Space Research (COSPAR), an international body charged with the coordination of worldwide space research including the prevention of interplanetary contamination. In 1964 COSPAR established a quantitative, probabilistic framework based on microbial risk, for the development of planetary protection standards (COSPAR 1964). The UN Space Treaty of 1967 asserts:

States party to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter, and where necessary, shall adopt appropriate measures for this purpose.

(United Nations 1967, Article IX)

By 1982—that is, after a large number of landings on the Moon, Mars, and Venus—COSPAR determined that the quantitative measure of risk it had been using (an assessment of the probability that life will replicate on a given planet or celestial body) was based on highly subjective speculation. In response, COSPAR adopted qualitative standards of spacecraft cleanliness based on the different life-detection priorities for planetary bodies. Different types of missions require increasing levels of cleanliness: a fly-by mission has less contamination risk than a lander or sample-return mission, and a mission to Mars or Europa would be held to higher standards than one to a planet deemed unlikely to harbor life [End Page 141] (for example, Venus). This shift in perspective highlights the nature of speculative science: outside the controlled environment of the lab, science progresses through what is essentially refined guesswork. The science of space travel makes assumptions about acceptable levels of risk, but risk (from localized effects to planetary destruction due to human error, technical malfunction, or unanticipated factors) is ubiquitous.

How much risk is too much? Rather than being solely addressed through disciplinary science, risk evaluation involves a consideration of our values, including our notion of progress and the relationship between humans, the environment, and technology. Policy makers have long sought scientific certainty to guide legislation, but it has become increasingly obvious that policy also depends on a complex and ambiguous network of human values, political capital, and public opinion—issues that cannot be disaggregated from each other.

The Viking mission in 1976 set the gold standard for NASA's planetary protection efforts. Scientific, governmental, and public optimism about the possibility of finding Martian life increased the awareness of risk, and NASA spent impressive sums to sterilize the spacecraft. According to one columnist, "to avoid contaminating its Mars life-detection experiments, NASA did everything short of encasing its spacecraft in condoms" (Wolfson 2002, 30). No mission since has achieved the same levels of compliance—not only is it cost-prohibitive to replicate Viking's planetary protection protocol, but the disappointing results of that mission's search for life suggested that cross-contamination may not be such a risk after all. However, recent information about Mars and discoveries about the nature of life on Earth have renewed the hope for, and therefore the risk of, finding life 'out there.' New evidence for massive chemical sediments at Meridiani Planum on Mars, from the Opportunity Rover have dramatically improved the case for standing surface water on early Mars. At the same time, astrobiologists have discovered that wherever liquid water exists on Earth, whether it be the highly acidic pools of Yellowstone or the Rio Tinto in Spain, or the deep within the crust, life is a real possibility.

The search for extraterrestrial life takes place on two distinct fronts, each with very different implications and policy requirements. First, the SETI (Search for Extra-Terrestrial Intelligence) community listens for signals or messages from civilizations outside the solar system. Second, [End Page 142] within the solar system, we search for evidence of present or past life by examining physical, chemical, geological, and biological data, acquired remotely from orbit, in situ, or through collected samples. Detection of life by any method would have dramatic consequences and require ready policy strategies for risk management, communication, education, ethical considerations, international interests, and public perception. Over a period of several years, the SETI Committee of the International Academy of Astronautics developed a Declaration of Principles to serve as guidelines following the detection of extraterrestrial intelligence. The Principles, approved by the Academy in 1989 and published in a special issue of Acta Astronautica in 1990, provide operational recommendations for a course of action immediately following a discovery (SETI 1990). These include:

• strategies for verification

• communication to scientific and political communities, the U.N., and the public

• protection of data, and

• responding to the signal

The Principles are vague and not intended for long-term policy, but they provide a rational and appropriate framework from which to proceed until further decisions can be made.6

Notably, there are no corresponding guidelines for addressing the detection of non-intelligent life forms, nor is there any NASA or international policy for the proper handling of extraterrestrial life.7 Detection by SETI of radio signals light years away poses no immediate risk, but would still raise culturally portentous ethical, philosophical, and theological questions. Even the discovery of microbial life would be a shock. Evidence of microbial life on another planet in our solar system would also require immediate decisions about safe handling, biological risk, experimentation procedures, scientific, legal, and societal ownership, and the proper means of communication to governmental agencies, the scientific community, and the public. These policies should be developed now, before anything is found, for the excitement incurred by such a significant discovery and the need for immediate action will likely affect our ability to formulate appropriate responses (how, for instance, would NASA break the news? How might the news be introduced to school children? [End Page 143] How would NASA engage and respond to religious communities?) These are humanities policy as much as science policy questions.

With an aggressive NASA agenda for future life-detection missions, the space science and policy communities will need to develop thoughtful strategies regarding biological and/or political risk of the discovery of life. Philosophical, psychological and theological issues (the possibility, for instance, of sudden societal unrest or greatly increased cult activity), in addition to ethical considerations, will necessarily play a central role in any such thinking. The development of a comprehensive strategy for addressing this discoverywill require interdisciplinary work that includes philosophers, theologians, and social scientists, as well as space scientists and policy makers.8

NASA has recently given some attention to these wider concerns. Some of the research within the NASA Astrobiology Institute (NAI) has considered philosophical issues. For instance, the NAI-sponsored Center for Astrobiology at the University of Colorado includes "philosophical and societal issues in astrobiology" as one of its research themes (Center for Astrobiology website). This research has focused on epistemological issues such as the difference between historical and experimental sciences. For example, philosopher Carol Cleland has explored the inconclusive nature of the 1976 Viking lander missions' biology experiments, experiments which were designed absent any data about the experimental variables—namely, the composition of Martian soil. "To this day," writes Cleland, "two of the researchers involved in the Viking life-detection experiments still insist that life was found to exist on Mars" (Cleland 2002, 479). Most scientists reject that claim, but the controversy demonstrates the difficulties involved in attempting to apply experimental science to the speculative realm. Such work needs to be complemented by more speculative and wide-ranging reflections on how the discovery of extraterrestrial life might affect our conception of ourselves.

Terraforming

Beside Earth, the most likely place in our galaxy to support life is Mars (McKay 1982). There are two possibilities here: either there is currently life of some sort on Mars, or the planet is abiotic but could, with modifications, support future life. Currently Mars is thought to be far too cold and dry to allow the sort of life found on Earth, but this conclusion [End Page 144] could be wrong. Scientists' understanding of life is necessarily limited to terrestrial biology; there is no real way to know what biochemical forms life might take elsewhere in the universe. Recent discoveries of extremophiles have proven that even on Earth life is remarkably persistent and can exist in extremely harsh environments. Microorganisms have been found a foot beneath the sands of the Chilean Atacaman Desert—one of the driest places on Earth and previously thought sterile (Mahoney 2004). Whole ecosystems thrive in hydrothermal vents 2000 meters below sea level, in complete absence of sunlight. Microbes discovered under ice in Greenland have survived at least 120,000 years (and perhaps as long as a million years) in subzero temperatures, low oxygen levels, and minimal nutrients (Britt 2004). Halobacteria live in highly concentrated saline environments such as those that might exist, or may have existed, in many locations on Mars (Landis 2001). These and other similar recent discoveries have renewed scientists' hope that some form of life could survive the harsh Martian environment, either present or past.9

Terraforming is the use of planetary engineering techniques to alter the environment of a planet in order to improve the chances of survival of an indigenous biology or to allow the habitation of most, if not all, terrestrial life forms (McKay 1990, 184–85). There is a sizeable body of literature on the science, rationale, and potential benefits of bringing life to Mars.10 The mechanics of terraforming essentially consist of warming the Martian climate by the release of carbon dioxide or other gases into the environment. This process is the same one that warms the climate of Earth—the greenhouse effect. It is thought that we will be able to do this in the foreseeable future, using contemporary or imminent technology (Zubrin & McKay 1997).

An argument in favor of terraforming is that such a grand experiment would yield valuable information about the complex interworkings of ecosystem processes on Earth. Robert Haynes suggests "we will never adequately understand the workings of our own biosphere until we have made a serious attempt at least to design, if not actually to generate, another one" (Haynes 1990).11 Indeed, the project would significantly advance our scientific knowledge of the nature of life. It is feasible to imagine that such understanding could have a dramatic effect on our ability to solve ecological problems on Earth. [End Page 145]

Of course, the issue of terraforming is not exclusively a scientific or technological one. Indeed, a number of talented scientists have noted that terraforming must be dealt with by those qualified to address ontological and theological questions about the nature of life (e.g., Haynes 1990).12 Few philosophers have approached the question—the majority of literature considering the ethics of such a project has been written by scientists. Those who have written about the ethical implications of terraforming (both scientists and philosophers) have tended to appeal to the intrinsic value issues involved in introducing terrestrial life to Mars. The questions usually take the following forms: Is life better than non-life? Is there value in nature absent the presence of life? Should we preserve the natural state of the red planet, or might we have an ethical obligation to populate the universe?

The answer to the last question is often a qualified yes. David Grin-spoon likens the issue to that of planting a garden in a vacant lot—if no life exists on Mars, then we have a duty to bring life to it: "Mars belongs to us [life] because this universe belongs to life" (Grinspoon 2004). Of course, a vacant lot is a human creation, and thus is a questionable analogy to a planet which happens to be naturally abiotic. Christopher McKay voices a similar position: "Life has precedence over non-life," he states; "life has value. A planet Mars with a natural global-scale biota has value vis-à-vis a planet with only sparse life or none at all" (McKay 1990).

Robert Zubrin, one of the most energetic and unequivocal spokesman of the case for bringing life to Mars, claims that the act of terraforming the Red Planet will prove that "the worlds of the heavens themselves are subject to the human intelligent will" (Zubrin 2002). Zubrin has called the argument that we should forgo the terraforming project if native life is found on Mars "immoral and insane," because humans are more important than bacteria. "In securing the Red Planet on behalf of life, humans will perform an act of improving creation so dramatic that it will affirm the value of the human race, and every member of it. There could be no activity more ethical" (Zubrin 2002, 179–80).

The terraforming project does not receive universal approval. An advocate of the 'hands-off' approach, or what has come to be called cosmic preservationism, is Rolston, who assigns value to the "creative projects" of nature, regardless of the existence of life or consciousness. [End Page 146] "Humans ought to preserve projects of formed integrity, wherever found…." [We should] "banish soon and forever the bias that only habitable places are good ones, and all uninhabitable places empty wastes, piles of dull stones, dreary, desolate swirls of gases" (Rolston 1986, 170–71). Alan Marshall, another preservationist, advocates strict enforcement measures to ensure that the planet continues to exist in its natural state. For Marshall, all of nature should receive respect; rocks, for instance, exist in "a blissful state of satori only afforded to non-living entities" (Marshall 1993).

Martyn Fogg, on the other hand, notes that efforts to protect a barren environment are often misanthropic critiques of human nature emphasizing our capacity for evil, or sentimental illusions based on outof date ecology. He offers as an example the ecocentrist notion of ecological harmony—"that there exists an ideal balance in nature that is perfect, unchanging, and which nurtures and sustains" (Fogg 2000a, 209). Such a state is a cozy sentimentality, he claims. "Nature is…better regarded as a continuous state of flux dominated by chaos and disharmony" (ibid.). Fogg counters Alan Marshall's argument that rocks exist in a state of 'blissful satori' by stating, "rocks don't think, don't act and don't care. They cannot have values of their own" (ibid., 210).

The question, however, of whether e.g., rocks have intrinsic value is different from whether they have values of their own. Abiotic nature can also have value through the relatedness of nature and natural objects to human beings. This value resides in the daily presence of humans in nature, humans as part of nature—something not (yet) true of the extraterrestrial world. We may be confident that rocks do not think, or have values of their own. But humans can nonetheless value rocks for their own sake—they can be experienced as beautiful, sublime, or sacred. Metaphysical, aesthetic, and theological questions such as these must be included as we address issues of terraforming.

Space exploration allows us to explore our relationship to the universe

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Revolutions in philosophic understanding and cultural worldviews inevitably accompany revolutions in science. As we expand our exploration of the heavens, we will also reflect on the broader human implications of advances in space. Moreover, our appreciation of human **[End Page 147]** impact on Earth systems will expand as we come to see the Earth within the context of the solar system. Most fundamentally, we need to anticipate and wrestle with the epistemological, metaphysical, and theological dimensions of space exploration, including the possibility of extraterrestrial life and the development of the space environment, as it pertains to our common understanding of the universe and of ourselves.

Such reflection should be performed by philosophers, metaphysicians, and theologians in regular conversation with the scientists who investigate space and the policy makers that direct the space program. The exploration of the universe is no experimental science, contained and controlled in a laboratory, but takes place in a vast and dynamic network of interconnected, interdependent realities. If (environmental) philosophy is to be a significant source of insight, philosophers will need to have a much broader range of effective strategies for interdisciplinary collaborations, framing their reflections with the goal of achieving policy-relevant results. If it is necessary for science and policy-makers to heed the advice of philosophers, it is equally necessary for philosophers to speak in concrete terms about real-world problems. A philosophic questioning about the relatedness of humans and the universe, in collaboration with a pragmatic, interdisciplinary approach to environmental problems, is the most responsible means of developing both the science and policy for the exploration of the final frontier.

## Exploration Good – Environment

Space exploration opened our eyes to the threat of environmental destruction which caused a massive environmental movement

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During the period in which humans first entered space, walked on the **[End Page 135]** Moon, and extended the range of human existence beyond the Earth, we began to pay attention to the habitability of our terrestrial home. The first images taken from space by the U.S. Weather Bureau's TRIOS satellite launched in 1960 showed a "pale blue dot" floating in a vast darkness ([Sagan 1994](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html#b29)). Worldwide, these images unleashed a wide range of remarks—on the Earth's fragility, insignificance, or magnificence, its stunning geographical features, and the non-existence of visible national boundaries.

While this cultural reflection was taking place, the community of professional philosophers was closeted in arcane debates. Since Dewey's death in 1952, the profession had overwhelmingly become a disciplinary domain whose research was written by and for philosophic experts. But despite the silence of philosophers (including environmental philosophers) on the subject, there is in fact a powerful link between our exploration of space, the reflections it elicits concerning the fate of our home planet, and the development of environmental ethics. This essay explores these connections, arguing that our thinking about both the future habitability of the planet ethics and the exploration of space is sharpened by bringing the two into more explicit contact.

A Lost Relation

As with our explorations of the extraterrestrial realm, the first reflections on the state of the planet were prompted by the work of scientists rather than philosophers or humanists. US Fish and Wildlife zoologist Rachel Carson's *Silent Spring* (1962) and Stanford University entomologist Paul Ehrlich's *The Population Bomb* (1968) highlighted concerns that came to nationwide expression in the first Earth Day in 1970—the year after the scientific, technological, and political triumph of the first landing on the Moon. The books shared a common rhetoric—ethical *cri de coeur* built on the supposedly objective foundation of science. For instance, Carson's claim that the effects of DDT radiated throughout the environment causing reproductive problems and death was quickly taken up as an argument for viewing nature as a web of life we needed to nurture and protect.

Professional philosophers were slow to catch up—environmental ethics did not become part of any university's curriculum until the 1970s, **[End Page 136]** when it was first taught by J. Baird Callicott at the University of Wisconsin, Stevens Point in 1971. The field did not gain a real foothold within academia until the 1980s. Even now, environmental ethics remains a stepchild of philosophy not meriting a category within the Leiter Report. It is marginal within the bulk of programs and departments.

But while space exploration may have contributed to the birth of environmental consciousness—giving us a new, more global perspective on our home—and environmental ethics, environmental ethics itself has paid little attention to the philosophical dimensions of space exploration or to the relation between the sub- and superlunary spheres. Even the scientific discovery of the importance of asteroid impacts in Earth's history (c. 1981) and the imminent impact of global climate change have done little to encourage reflection on Earth within an extraterrestrial context.[1](http://muse.jhu.edu/journals/ethics_and_the_environment/v013/13.1.daly.html#f1) Of course, humans have long populated the heavens with spirits, and theologians and philosophers such as St. Thomas Aquinas (d. 1274) and Giordano Bruno (d. 1600) considered the possibility of extraterrestrial rational intellects. But before the launching of Sputnik in 1957, philosophic consideration of space was lodged within the science fiction literature of H.G. Wells, Jules Verne, Ray Bradbury, Arthur C. Clarke, and others.

Reibaldi 94 - Giuseppe G. Reibaldi - Professor of Space Policy at the Aerospace School of the University ‘La Sapienza’ Rome, Oct 5 1994, “CONTRIBUTION OF SPACE ACTIVITIES TO PEACE,” <http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6V1N-3YMWKKB-7-1&_cdi=5679&_user=1458830&_pii=009457659400292T&_origin=&_coverDate=04%2F30%2F1995&_sk=999649991&view=c&wchp=dGLzVlb-zSkWA&_valck=1&md5=d9b43e1892e4fce1a229ac8a1d40cffb&ie=/sdarticle.pdf>

The 1970s have seen the rise of ecological move- ments, originating from the view of the fragile Earth, as photographed by the Apollo astronauts on the way to the Moon. The human species already consumes or destroys 40% of all energy produced by terrestrial photosynthesis, that is, 40% of the food potentially available to living things on land. Predictions for the future indicate that tropical forests will continue to be destroyed, arable land will shrink because of the top soil pollution that cannot be repaired. The control of the environment is no longer the issue of a single state but its implication is international, so it requires close monitoring to avoid disputes in this matter, eventually generating situations of conflict.

Governments realized that pollution had reached unsurpassed levels and after several years of futile discussions they agreed on several environmental treaties which limited the use of substances which proved to be dangerous to the environment (i.e. Montreal Accord which seeks to limit the global emission of CFCs to protect the ozone layer). The United Nations Conference on Environment and Development in Rio de Janeiro in 1992 was a signifi- cant step in this direction, since it was attended by 118 Heads of State and Government. Delegates from rich and poor countries participating in the Rio Conference worked out agreements to protect bio- diversity, control carbon dioxide emission and slow deforestation. Those agreements require verification in order to be credible and binding for the countries which adhere to it. Earth observing satellites can bring awareness of any violation of environmental treaties as an independent source of information. For example, the European Space Agency’s Earth Remote Sensing 1 (ERS-1) satellite can detect, by day and by night, river pollution and identify the poten- tial responsible, or oil leakage generated by a trans- port ship which is washing its tanks in international waters. Furthermore, space technology can provide easier access to “soft technology” such as education and health care as well as “hard technology” such as telecommunication and discovery of natural re- sources and this will help developing countries in achieving a policy of sustainable development.

## A2: Imperialism

Christmas Eve, 1968. Apollo 8 was making history. The American astronauts had left Earth's orbit. They'd seen the dark side of the Moon. Now, on their fourth circuit around the Moon, they experienced another “first”.

“Oh my God, look at that picture over there,” Frank Borman said.

“What is it?” Bill Anders asked.

“It's the Earth coming up. Wow, is that pretty!”

And, through tiny windows, the three astronauts watched the Earth rise --- a ball of color in a sea of black and white space.

NASA had planned the mission with granular precision, but not this, not the memorializing with film. Anders realized that if there was ever a photograph worth taking, this was it. A black-and-white camera was produced. Snap! And then they took the color shot.

“Earthrise” turned out to be the most powerful photo ever taken.

It's hard to believe, but until the mid-1960s, no one really knew the color of the Earth. And although the first rockets to leave the planet gave a new sense of our home, really seeing the Earth whole wasn't a priority --- the only reason Apollo 8 went to the Moon instead of merely orbiting the earth in 1968 was that the CIA had learned the Russians were planning a lunar fly-by. That was all the motivation NASA needed; after Sputnik, beating the Russians in space was a government priority. The Moon, for our government, was “a battlefield in the Cold War.”

So there was no thought of taking pictures of the Earth. In fact, there was so little concern about photography that season at NASA that we don't have a shot of Neil Armstrong, the first man off Apollo, walking on the Moon. (The pictures you've seen are of Buzz Aldrin, the second man.)

But minutes after the launch of Apollo 8, the flight took on a flavor that had nothing to do with military might or propaganda.

“This must be what God sees,” Frank Borman thought, looking back at his home planet as Apollo 8 floated toward the Moon.

That was just preamble to his reaction to the view of the earth from the Moon: "It was the most beautiful, heart-catching sight of my life, one that sent a torrent of nostalgia, of sheer homesickness, surging through me.

Space exploration isn’t imperialist – past exploration caused us to want to return to and preserve the Earth

Kornbluth 09 – Jesse Kornbluth – book reviewer for Head Butler; Robert Poole – author of Earthrise - reader in history, University of Cumbria, “Earthrise: How Man First Saw the Earth,” <http://www.headbutler.com/books/non-fiction/earthrise-how-man-first-saw-earth>

So [Earthrise: How Man First Saw the Earth](http://www.amazon.com/exec/obidos/ASIN/0300137664/headbutlercom-20/) is more than the story of one picture --- it's about the effect of that picture. Before the American space program, there was a strain in science fiction that the Earth was destined to die. It was, by this way of thinking, man's destiny to explore space --- and colonize it.

After Apollo 8, a different view emerged: that the function of space exploration is to remind us that the direction we need to go is homeward. The poet Archibald MacLeish regarded that photo as a tipping point: "To see the earth as it truly is, small and blue and beautiful in that eternal silence where it floats, is to see ourselves as riders on the earth together, brothers on that bright loveliness in the eternal cold --- brothers who know that they are truly brothers."

History moved fast. Months later, that photograph was [the cover of The Whole Earth Catalog](http://en.wikipedia.org/wiki/File%3AWh-earth-69-cover.jpg).
A year later, America environmentalists organized the first Earth Day. And then came a movement that grows bigger each year.

“Earthrise” tells many stories. As you'd expect from a Yale University Press publication, you get a capsule history of the Moon, the space program and the Cold War. You get  surprises galore: Robert Poole persuasively argues there was no “missile gap” and that the United States was winning the missile race all along. What you don't get: a Tom Wolfe narrative. Well, there are other rewards, like this revelation: “In the depths of the Cold War, peace broke out in space.”

Our most common human longing is for peace. “Earthrise” takes that longing and, through the experiences of three men who could never be described as mystical, gives it a credible focus. That is, it makes planetary consciousness something you can appreciate without being a stoned-out hippie, a raving environmentalist or a crank. As Bill Anders put it, he was "immediately almost overcome by the thought that here we came all this way to the Moon, and yet the most significant thing we're seeing is our own home planet, the Earth."

That could be the most powerful thought of the Twentieth Century. No wonder it moved so quickly from the Moon back to Earth and travels now, faster and faster, around the globe.

Space isn’t imperialist – whatever the intentions were of space exploration, the cultural impact means that it’s not imperialist

Henry and Taylor 09 – Holly Henry and Amanda Taylor - California State University, May 15 2009, “Re-thinking Apollo: envisioning environmentalism in space,” <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-954X.2009.01825.x/full>

The Apollo programme's impact on the ecology movement in the US provides a powerful analogue of current astroenvironmental initiatives for future manned planetary exploration. Those now famous Apollo 8 images of Earthrise from the Moon and Apollo 17's image of the Whole Earth in the black abyss of space profoundly focused the US – and ultimately the world – on ecocritical concerns and **called into question the rhetoric of Manifest Destiny** that in part fuelled the Apollo era. As humans continue their journey across the solar system, imaginative artistic renderings of planetary landscapes also often suggest, like the Apollo photos of Earth, the need for greater ecocritical awareness. A cultural analysis of the impact of widely distributed Apollo photographs on an emerging environmental movement, and of artistic renderings by Chesley Bonestell, David Hardy, and Chris Butler, suggests that continued exploration of the solar system must proceed with the environmental awareness gained from Apollo.

Twenty-seven astronauts travelled to the Moon. Twelve spent a total of 300 hours on the lunar surface. These men captured on film, often by sheer chance, ‘some of the most spectacular snapshots in the history of photography’ ([Crouch, 1999](http://onlinelibrary.wiley.com/doi/10.1111/j.1467-954X.2009.01825.x/full#b13): 226). The Apollo 8 image ofEarthrise as well as Apollo 17's photo of Whole Earth appeared on the walls of corporate offices and powerfully provoked a sense of humanity's inherent responsibility to one another. Set against the black wastes of space, these two Apollo photos galvanized the ecology movement in the US and sparked a radical rethinking of our dependence on, and responsibility to, sustaining Earth's ecosystems and the diversity of life on our fragile biosphere. In an analysis of the Apollo photo archive, cultural geographer Denis Cosgrove has eloquently argued that Earthrise and Whole Earth have defined Apollo's legacy, at least in the popular imagination.[1](http://onlinelibrary.wiley.com/doi/10.1111/j.1467-954X.2009.01825.x/full#en1) Surprisingly, those two images were neither specifically planned nor particularly prioritized by NASA. Yet, as Cosgrove points out, ‘it was [NASA's] low priority targets of opportunity that would yield some of the most enduring images of the entire Apollo program’ (1994: 274).

Cosgrove has meticulously demonstrated that the Apollo photographs are multivalent. Earthrise and Whole Earth, Cosgrove rightly argues, are deeply embedded within a western imperialist global imagination that dates back to at least Constantine; the photos are situated within a variety of imperialist discourses and their armature of cartography, globe making, and of commodifying the Earth and its populations as resource (1994: 272). Yet, as Cosgrove admits, **the cultural impact and resonance of the Apollo photographs far supersede even hundreds of years of imperialism, as the photos equally connote a sense of Earth's biodiversity and inherent agency.** Such a perspective reflects the work of science studies theorist Donna Haraway, who contends that scientific narrative must provide responsible accounts of the world to afford nature, which cannot speak for itself, a voice. For [Haraway](http://onlinelibrary.wiley.com/doi/10.1111/j.1467-954X.2009.01825.x/full#b17), both ‘scientists and organisms are actors in a story-telling practice,’ which suggests that investigating what narratives are told about the Apollo photos of Earth, and why, matters (1989: 5). Whatever the motive in planting the American flag on the Moon, if only to trump the Soviets in the space race, the Apollo images resist being narrated as merely conquered frontier and instead powerfully revealed Earth's agency as an autonomous, self-regulating biosphere.

Mark Williamson posits that ‘the most significant legacy of the Space Age is the image of the Earth rising above the surface of the Moon’ (2006: 11). Earthrise was captured on film in December 1968 by Apollo 8 Commander Frank Borman and crewman William Anders. During this first manned mission to the Moon, Anders was to photograph the lunar surface in search of a landing site for Apollo 11 and obtain photos of the far side of the Moon, which never faces the Earth. On their fourth orbit, as Apollo 8 emerged at the equator from behind the Moon, Borman repositioned the spacecraft to regain radio contact with mission control. Unexpectedly, he caught a glimpse of the Earth just beyond the Moon's limb, grabbed Anders's camera loaded with black-and-white film, and shot a photo. The crew were the first ever to observe an Earthrise and instantly knew they needed to photograph the event in colour. Jim Lovell scrambled to find a colour cartridge, which Anders subsequently loaded into the camera. Anders then took two more photos, including the now famous image of the blue, half shadowed Earth above a desiccated lunar landscape.2

Though NASA listed among its photographic objectives for Apollo 8 ‘long distance Earth photography,’ including analyses of Earth's atmosphere, weather, and terrain, Cosgrove suggests that photographs of Earth were ‘almost an afterthought in mission planning’ (1994: 274). In fact, when Borman rolled the spacecraft and declared, ‘Oh, my God! Look at that picture over there! Here's the Earth coming up,’ Anders jokingly responded, ‘Hey, don't take that, it's not scheduled,’ upon which the crew burst into laughter.3 Later during their ninth orbit of the Moon, the crew presented a live TV broadcast that began with a blurry glimpse of Earth above the lunar surface. While describing the lunar terrain, the crew turned the camera to the forbidding landscape scrolling beneath the Command Module and read the opening of Genesis. Earth was seen in deep time as well as in deep space. Robert Poole writes of the Earthrise images, ‘the view seemed eternal, like a snapshot of the creation’ (2008: 195).

Published just two days after Apollo 8 returned, ‘Earthrise was the subject of immediate commentary and speculation about a reformed view of the world’ (Cosgrove, 1994: 273). Though most publications of Earthrise usually present the lunar surface as horizontal, Bill Anders points out that the accurate orientation of the photograph should be with the Earth to the left of the Moon's vertical limb, as that was the astronauts’ view from the Apollo 8 spacecraft.4 Either way, the photo was a sensation, and had, as astronomer Fred Hoyle anticipated in 1948 regarding the eventual first widely disseminated photo of Earth, confronted humankind with ‘a new idea as powerful as any in history’ (cited in Zimmerman, 1998: ix).5 The Apollo astronauts themselves have reflected on the significance of Earthrise. Anders recalls,

Space exploration allows us to understand our cosmic insignificance

Henry and Taylor 09 – Holly Henry and Amanda Taylor - California State University, May 15 2009, “Re-thinking Apollo: envisioning environmentalism in space,” <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-954X.2009.01825.x/full>

When I looked up and saw the Earth coming up on this very stark, beat-up lunar horizon, an Earth that was the only color that we could see, a very fragile looking Earth, a very delicate Earth, I was immediately almost overcome with the thought that here we came all this way to the Moon and yet the most significant thing we are seeing is our own home planet, the Earth. (Ritsko, 1999)

Jim Lovell, also onboard Apollo 8 and later commander of Apollo 13, likewise has commented on the impact of Earthrise on the broader national imaginary: ‘We learned a lot about the Moon, but what we really learned was about the Earth ... and how insignificant we really all are. But then, how fortunate we are ... to enjoy living here amongst the beauty of the Earth itself’ (Sington, 2007).

If Earthrise took the astronauts and the American public by surprise, Apollo 17's Whole Earth image of the fully illuminated Earth in space stunned the world. Nobel Prize author and former US Vice President Al Gore contends that Whole Earth‘has become the most commonly published photograph in all of history’ (2003: 15).6 Yet, Cosgrove notes, the serendipity and rarity of the Whole Earth photos are little understood: Referred to by NASA as simply AS 17-148-22727, Whole Earth was taken in a series of 11 photos by astronaut Harrison Schmitt on December 7, 1972.7 The photos were shot at approximately 28,000 miles from Earth as Apollo 17 raced toward the Moon at roughly 25,000 miles per hour. Given the orientation of the Earth and Sun during the nine Apollo Moon missions, only Apollo 17's crew could glimpse and photograph the fully illuminated globe of Earth in space. This was the only set of full-phase Earth images ever taken by an astronaut, and not a space probe. Though taken with a camera plagued with uneven exposure difficulties, 22727 for the first time in the history of our species allowed the human eye to register the Earth's full globe set against the empty wastes of space.8 It is no wonder the image has become iconic.

22727 is not, however, the first photograph of the fully illuminated Earth. As early as 1966, ‘Lunar Orbiter 1, an unmanned lunar vehicle, sent from lunar orbit a blank and white full-Earth photograph that had been processed in space and electronically recomposed back on the ground,’ and in 1967 a US Navy satellite snapped a colour photograph of the full disc of Earth but, apparently due to their poor resolution, neither of these photos were widely circulated (Cosgrove, 1994: 275). Nor was 22727 the first widely distributed whole Earth image. As early as 1966, Stewart Brand, an early environmentalist from San Francisco, wondered why NASA had not released a satellite image of the whole Earth; he was convinced by Buckminster Fuller's theory that eco-awareness would become widespread once people perceived the Earth as a delicate biosphere (Tierney, 2007: F1). Brand later obtained a NASA satellite photo of the Earth in full phase and used it to illustrate the Fall 1968 cover of his newly self-published Whole Earth Catalog.9 But at that point, humans had not yet traveled 28,000 miles into space, much less to a cratered lunar surface a quarter million miles away. Nor could they articulate what such a view evoked – that is, not until Apollo journeyed to the Moon.

As with Earthrise, the image of Apollo 17's Whole Earth became indelibly etched into the human imagination. Both photos revealed Earth as a fragile oasis, a biosphere of tremendous biodiversity. Apollo 15 Commander Dave Scott recently commented on the impact of Apollo in shaping a global environmental awareness: ‘It [the Earth] truly is an oasis. ... I think the elevation of that awareness is a real contribution [of Apollo] to saving the Earth, if we will’ (Sington, 2007). Robert Poole's Earthrise offers a delightful, scholarly and detailed investigation of the Apollo programme's many contributors to environmentalism (2008). That Apollo forever altered the way we see ourselves in relation to our planet is indisputable, though its specific intervention in the environmental movement is nearly impossible to map.The environmental movement in the US existed long before the Apollo programme, dating to the 1890s with the establishment of Sequoia and Yosemite National Parks in 1890, the Forest Reserve Act of 1891 that preceded the formation of a national forest service, and the founding of the Sierra Club in 1892. By the 1960s, multiple events in the US, including the emergence of NASA in 1958, nuclear weapons testing, publication of Rachel Carson'sSilent Spring (1962), the Civil Rights Movement, and the Peace Movement converged in sparking widespread and various responses to environmental concerns. However, it is widely conceded that with the first Earth Day in 1970, ‘a truly national ecology movement took shape’ (Giugni, 2004: 39). According to Flight Director Gene Kranz, ‘Apollo 8's stunning images of the Earth in vibrant color’ became for the environmental movement in the US ‘a powerful visual expression of the concept of “Spaceship Earth”?’, a phrase coined by Buckminster Fuller to depict the Earth as a self-contained biosphere sweeping through the voids of space (2000: 247). Nature photographer Galen Rowell declared in 1995 that Anders's colour photograph of Earthrise has been ‘the most influential environmental photograph ever taken’ (cited in Zimmerman, 1998: 242). Likewise Apollo 17's Whole Earth image was immediately taken up in environmental discourse. ‘In the 1970s, photo 22727 quickly became the Earth Day logo in the United States, while the environmental lobby group Friends of the Earth used it effectively to convey a message of global dwelling, care, and fragility,’ explains Cosgrove (2001: 263).10 Aarguably the most important recent contribution to the environmental movement by a single individual, Al Gore, in both his text and film An Inconvenient Truth, has powerfully used Earthrise and Whole Earth rhetorically to frame his appeal for greater eco-awareness and global action. Of Earthrise, Gore writes: ‘The image exploded into the consciousness of humankind ... In fact, within two years of this picture being taken, the modern environmental movement was born. In the US, the Clean Air Act, the Clean Water Act, the Natural Environmental Policy Act, and the first Earth Day all came within a few years of this picture being seen for the first time’ (2003: 12).11

By sheer coincidence, Cosgrove observed, Apollo 17's Whole Earth frames Africa, the origin of humankind, not the US or western Europe; its image of a blue planet swirled in clouds, he further contended,strips away the graticule, principal signifier of Western knowledge and control, radically challenging a global image dominant over four hundred years. Thus liberated, and with no signs of meaning, boundary marking, or possession, Earth appears to float free as a sui generis organism. (2001: 261)

The cover of James Lovelock's text Gaia (1979) was illustrated with the Whole Earth image, precisely to make the point that Earth is an autonomous, life-sustaining organism (Cosgrove, 2001: 263).12 Centuries before Apollo, Immanuel Kant had intuited that Earth is not, in actuality, the property of nations or individuals. In his 1795 essay ‘Toward Perpetual Peace,’Kant argued that the right to travel belongs to all humans as they share ‘in common of the earth's surface on which, as a sphere, they cannot disperse infinitely ...’ (1996: 329). The Earth in principle cannot be owned, claimed Kant, as all people have ‘a common right to the face of the earth’ (1986: 284–5). After Apollo 8's Earthrise, Robert Zimmerman claims, Earth could ‘no longer be seen as land over which nations could claim control’ (1998: 245).

Many space historians have observed that the Apollo photos of Earth afforded humankind the opportunity to see our planet in context, to see just how fragile our world, and all life on Earth, really is. Wyn Wachhorst speculates, ‘If the essence of exploration is to touch the boundary – the beach, the mountaintop, or the moon – the core of the human condition is the attempt to see the self in context. To stand on the moons of Saturn and see the Earth in perspective is to act out the unique identity of our species’ (2001: 78). Standing on the surface of our Moon, Apollo 17 commander Eugene Cernan recounts seeing Earth turn on its axis, with multiple time zones visible at once, and realizing how our finite constructs, such as standardized time, do not translate well in the larger context of space. ‘Another hundred years may pass before we understand the true significance of Apollo,’ predicts Cernan, ‘Lunar exploration was not the equivalent of an American pyramid, some idle monument to technology, but more of a Rosetta stone, a key to unlocking dreams as yet undreamed’ (Cernan and Davis, 2000: 344). Apollo seems to have been the Rosetta Stone by which not just the American public but all of humankind could see itself in context and decipher our own situatedness and need for ecocritical awareness. Apollo invited us to think beyond ourselves, to think environmentally about the worlds we yet dream of exploring: Mars, Europa, the moons of Saturn.

If the Apollo programme can be thought of as a Rosetta stone as Cernan suggests, its decryption began with its iconic Earth photographs, which illustrated, first, Earth as a fragile environment in need of protection and, second, space as a natural extension of the Earth's environment. Realistic space art builds particularly on the second concept and helps us envision ourselves in the space environment.13 Though space art arguably began with the first pictorial representations of the night sky, these representations did not enable viewers to envision themselves in space due to a lack of sufficient detail. Thus, artists relied more on their imagination than on available science to depict celestial bodies. Space artist Ron Miller posits that two things were necessary to alleviate this problem. We needed ‘scientific knowledge about the actual conditions that existed beyond the Earth's atmosphere or on the Moon and other planets, and a realistic means of leaving the Earth’ (1996: 139). Miller claims that the first condition was met when Galileo in 1610 provided the first detailed, scientific knowledge of other planets by ‘turn[ing] a telescope toward the heavens’ by which ‘mankind realized for the first time that there were worlds other than this one’ (1996: 139). Miller's choice of ‘worlds’ over ‘planets’ in this passage is significant. The use of ‘planet’ suggests distance and mystery where the use of ‘world’ suggests nearness and familiarity. While planets were known to exist well before Galileo, his telescope provided details about these distant, cold planets that transformed them into knowable worlds.

Space art and the alien-as-familiar

Though Galileo's telescope ‘moved the heavens from the realm of the mystical into that of the physical,’ technology, as Miller notes, did not make ‘this new heaven accessible’ (1996: 139) until 1783 with the invention of the balloon. With the balloon, humans could actually leave the ground and seem to touch the sky, hinting at the possibility of someday actually leaving Earth to visit new worlds. In the meantime, however, if ‘it was not possible to reach these new worlds in the sky in reality,’ art could make it possible ‘by proxy’ (1996: 140). This is particularly the case with realistic space art. Science writer and space art collector Andrew Fazekas claims that the work of realistic space artists requires knowledge of ‘astronomy, geology, space technology, hardware, or even astrobiology’ (2004: 79). Such knowledge allows realistic space artists to render alien environments as accurately as possible, enabling viewers more easily to imagine themselves as part of these environments. Fazekas writes, ‘[T]he artistic ability to ... transform the coldness of science into a uniquely human experience makes space artists indispensable’ (2004: 79).

Described as the ‘father of astronomical art,’ Chesley Bonestell is one of these indispensable artists (Miller, 1996: 142). As Wyn Wachhorst observes, ‘Bonestell brought the edge of infinity out of the abstract and into the realm of experience’ (2001: 58). We see this in Bonestell's now iconic ‘Saturn as seen from Titan’, which appeared in May 1944 in Life magazine.14 This painting invited viewers into the possible planetary landscapes that exist on moons of the outer solar system. In Bonestell's depiction, Titan's landscape resembles that of the American Southwest or perhaps the craggy cliffs of the Rocky Mountains in winter. The deep blue of the sky recalls that of Earth; the view of Saturn is reminiscent of the view of the Moon we would expect in an Earth landscape. Miller argues that the ‘almost intense believability’ of Bonestell's paintings is ‘far more important than any mere scientific facts they may [entail]’ (1996: 142). Even if Bonestell's work was not completely accurate, viewers can imagine themselves standing on Titan viewing Saturn, an important quality considering that this particular Bonestell piece pre-dates spaceflight.15 The painting had an undeniable impact on many engineers, astronauts, and civilians in what became the US space programme. ‘For those who grew up with Bonestell's painstaking accuracy in light, shadow, perspective and scale, the reality of spaceflight seemed a foregone conclusion’ (Wachhorst, 2001: 50).

Bonestell's ability to portray perspective and scale is evident in his placement of ‘tiny space suited figures in most of his scenes’ (Wachhorst, 2001: 49) not only as a type of signature, but also as a reminder of the immensity of space as compared to humans. Humans are almost incidental in Bonestell's work; rather, it is the landscape that dominates the view and invites contemplation. Bonestell's paintings allow us to view Saturn in the same way the Apollo images allow us to view Earth as part of a larger space environment. Mark Williamson contends that ‘the space environment deserves at least as much consideration as the terrestrial environment’ and that ‘many aspects of the space environment are more fragile than the Earth's because they lack the Earth's capability for self repair’ (2006: 244). Williamson further argues that both the general public and space professionals need to be educated, without being alienated, about astroenvironmental concerns such as the environmental impact of exploration on other planetary bodies.

Williamson suggests that this education could ‘perhaps tak[e] the line of the 19th century wilderness painters’ (2006: 257). These painters’ landscapes had a significant impact on the eventual creation of the US national park system. Their paintings helped viewers to see inhospitable, even savage lands as ‘places of natural beauty’ (2006: 255–56), which fostered a sense of emotional attachment to these lands, ultimately leading to their protection. Williamson does not transfer this potential to space artists, however. Rather, he seems to privilege photography over art in raising astroenvironmental awareness. He writes, ‘Whereas photographs of the Earth from space, particularly those resulting from the Apollo missions, had an important affect on society ... images of the more distant planetary bodies are unlikely to provide such a fundamental boost to the planetary environment movement’ (2006: 257). Williamson seems both to forget how Bonestell's art captivated the popular imagination and to minimize the effects that space art can have. It seems plausible that realistic space art could galvanize a planetary environment movement in the same way the Apollo images impacted the ecology movement. For example, astronaut and space artist Alan Bean's‘Kissing the Earth’ deliberately reworks the Earthrise image so that Earth overwhelms the viewer, only to confirm Bill Anders's observation that it took traveling a quarter million miles to the Moon to understand Earth's fragility.16 While Williamson includes space artwork with similar potential in his book, such as David Hardy's 1997 painting ‘Neighbours’, he does not give it adequate attention (2006: 274).

Figure 2:In ‘Neighbours’ by David Hardy, the terrain of the Moon and Mars appears as a natural extension of Earth's landscapes, even as the Moon and Mars seemingly comprise Earth's core and mantle. Photo credit: David A. http://Hardy/www.astroart.org.

Seeing the Earth as analogue

Hardy describes ‘Neighbours’ as more abstract than his other work, which he says is typically ‘purely realistic and representational’. Like Bonestell, Hardy offers us a view of a world in context. ‘Neighbours’ simultaneously recalls and complicates the Whole Earth image. As in the Apollo image, the Earth is central to the backdrop of space. Its vibrant blue ocean is interrupted by a wisp of cloud and surrounds not Africa as in Whole Earth, but Mars and the Moon. Intriguingly, Mars and the Moon seem to form Earth's mantle and core. Additionally, all three bodies are depicted in their ‘relative sizes and terrains, with all their similarities and differences’ (Hardy, 2008) This is in accordance with Hardy's determination to ‘rende[r] pictorially as accurately as possible aspects of astronomy ...’ (Hardy, 1976: 95). In Hardy's work, Earth's landscapes become an analogue for its planetary neighbors.17

Whereas Hardy's piece focuses on planetary environments, artist Chris Butler primarily focuses on humans interacting with these environments. Heavily influenced by his personal attachment to the Apollo programme, Butler's artwork seeks to recapture a sense of discovery he feels has been lost in the post-Apollo years. Butler literally grew up with Apollo. His father, Robert E. Butler, worked on the development of the Apollo lunar spacecraft and later the Space Shuttle and introduced Chris to all of the Apollo astronauts, some of whom remain family friends. Butler comments that ‘space was and is very real’ to him and that, as a child, he expected the Apollo missions would evolve into Mars exploration. The discontinuation of the Apollo programme was a ‘huge, crushing disappointment’ and Butler turned to painting to recapture the world he had lost. Much of Butler's art shows a single astronaut or spaceship in the expanse of space or on a distant planet, evoking the possibility of engaging firsthand in these landscapes. This evocation contributes to the two main purposes his artwork serves. First, his art is meant ‘to get people to think and feel about space’ while accomplishing the second purpose, resuming planetary exploration. (Butler, 2008b)

Butler insists, however, that we must conduct this exploration responsibly, evidenced by his work ‘Water, Water Everywhere’.18 Inspired by a polluted Los Angeles beach, this painting depicts an astronaut in full space gear standing ankle deep in an alien ocean. We simultaneously sense familiarity and apprehension in the scene as the astronaut, poised to wade in further, more fully considers the new environment. The ocean looks like a terrestrial ocean, but only because like Earth's oceans, it reflects the blue sky. An ocean of liquid methane, for example, could also reflect the blue sky and would have water-like properties. Having no idea what organisms or chemicals lurk in the water, and despite the initial thrill of discovering something familiar, the astronaut rightly hesitates. As Butler indicates, on a ‘world very likely to have life, direct contact would be both irresponsible and extremely dangerous to all concerned [until] decades of study were made.’ (Butler, 2008a)

Figure 3:‘Water, Water Everywhere’ by Chris Butler imagines an astronaut on the verge of wading into an alien ocean. Photo credit: Chris Butler/Science Photo Library.

While depicting the need to consider the environmental impact of future exploration, ‘Water, Water Everywhere’ illustrates more than just an environmental consciousness. Butler's use of a coastal landscape echoes Bonestell's work, which, as Wachhorst observes, often deploys the ‘root metaphor’ of ‘the shoreline itself. The interface of known and unknown, civilization and wilderness, [...] the beach is [a] narrow band of equilibrium ...’ (2001: 54–5). Stepping off the shoreline into the ocean symbolizes an embrasure of the unknown wilderness. If space is humankind's ‘new ocean’ as President John F. Kennedy suggested, perhaps ‘Water, Water Everywhere’ reflects the fact that humans have only got our feet wet and need to pause to consider the ramifications of such a step for the sake of both humanity and the space environment.

Recent initiatives by the US, China, and Russia for return manned missions to the Moon, and American space enthusiasts’ proposals for space tourism and possible terraforming of Mars, have raised concern about the protection of planetary wildernesses. This is especially relevant in light of the discovery of extremophiles thriving near deep-sea volcanic hydrothermal vents, which indicates that microbial or other life forms could survive in the oceans of Jupiter's moon Europa or in the permafrost of Mars.19 Astroenvironmentalists argue that determining whether life exists, or existed, in these and similar locations in the solar system will require an even greater ecocritical awareness in planning missions to Mars, as well as sample-return missions, both robotic and manned, that could impact Earth's own ecosystems.

To mitigate this impact, Charles S. Cockell and Gerda Horneck propose a ‘planetary park’ system similar to a national park system.20 A planetary park system would both preserve and protect planetary environments. Preservation would mandate certain areas of planetary bodies off-limits to human use; protection would mandate protocols for the responsible use of certain areas of planetary bodies. Cockell and Horneck offer four main arguments for this type of system.21 First, they argue that ‘we need wilderness areas’ to help us define our culture and civilization (2006: 258). Second, like Earth, other planetary bodies ‘exist independently of human valuation’ and have ‘value in [their] own right’ (2006: 258). Third, a planetary park system ‘expresses a respect for the options and choices’ of future generations (2006: 258). Finally, Cockell and Horneck argue that we must preserve extraterrestrial lands for the potential, if currently unknown, resources or other benefits they may contain (2006: 258).

If space exploration and tourism are to increase in the coming decades, protection of the space environment must become a major objective for entrepreneurs and space agencies alike. Williamson reports that in 1963 President Kennedy approved a military test ‘to detonate a nuclear weapon on the inner edge of the Van Allen belts’; ‘the explosion,’ Williamson notes, ‘created ‘a little Van Allen Belt of its own’ (2006: 53).22 Current estimates indicate that ‘one tonne of uranium 235 and fission products’ as well as roughly 100,000 pieces of space debris orbit our planet and subsequently threaten space missions, the space station, as well as the numerous satellites that sustain our world (Williamson, 2006: 55, 79). Those first amazing images of the blue Earth rising over a stark lunar surface sparked the public imagination and suggested the need for global ecocritical awareness. Though not as ubiquitous as the Apollo images, realistic space art has contributed to an emerging astroenvironmental consciousness that envisions space as a natural extension of Earth's environment and suggests ways we might encounter alien landscapes and not only survive, but thrive. With humanity poised to return to the Moon and venture on to Mars, envisioning and articulating our purposes in space will make all the difference regarding the protection of worlds we may someday inhabit.

## A2: Leaving Earth is Bad

### The affirmative doesn’t attempt to leave Earth – instead, we acknowledge the utility of space and focus on Earth

Pass et al 10 – Jim pass, Ph.D. in sociology and lecturer in sociology, Christopher Hearsey, ARI Director of Programs and Special Projects, Simon Caroti, Ph.D. in literature and ARI Director of Educational and Public Outreach, September 2 2010, “Refining the Definition of Astrosociology Utilizing Three Perspectives,” American Institute of Aeronautics and Astronautics, http://www.astrosociology.org/Library/PDF/Space2010\_3Perspectives.pdf

Some of the ways in which space affects humanity on Earth – and, by definition, on societies, institutions, social groups, and individuals – causes human beings to become content with remaining on Earth. Abstractly, humanity pulls space toward Earth. The causal arrow is from space to Earth. Most humans reside on Earth but utilize space resources to enhance their lives. Travel into space occurs to fulfill the objective of bringing benefits back to Earth. Some people may recognize the benefits of space but prefer to improve conditions on their home planet rather than leaving for off-world destinations. These types of forces both contribute most to the development of terrestrial spacefaring societies. The exploitation of space resources from asteroids for use on Earth serves as a good example. The areas of solving or mitigating social problems with space assets, spinoffs and technology transfers, and knowledge resulting from the space sciences such as astronomy and space missions easily come to mind. Of course, there will always be those on Earth who benefit from space resources and other forms of astrosocial phenomena without taking part in the process. They do not seek benefits from astrosocial phenomena. They merely stand by, ignore, or fail to recognize efforts made without taking part or supporting the effort. If they benefit, it is only because their passivity did not hinder the creation of beneficial results through their opposition. This category of humanity represents the largest segment in the beginning phases of humanity’s migration into space.