

SPACE: AMORAL

The Universe offers humanity endless possibilities and new frontiers, but can we maintain the ideas of civilization and civility so far from home?

Forget about NASA's inability to build a reasonably priced and truly useful space station.

Forget about NASA's inability to create efficient, reliable and low-cost Earth-to-Low-Earth-Orbit transportation.

Forget about the abysmal failures of the politically driven, Cold War-initiated American space program, as we've known it.

Instead, understand this simple truth: Humanity is eventually going to extend all aspects of Earth-bound living into space. We will live, work, study, play, have sex, fight, die, get married, get divorced, worship God, ignore God, raise children, grow old, pay taxes, vote and so on in space.

This is very likely to happen because, for the first time since the beginning of the space age, the possibility of a vibrant private sector developing space vehicles and habitats for non-government consumers is within our reach. As we've seen with terrestrial transportation and building-construction industries, competition and new markets have the potential to bring down the cost of getting to and living in space, and this is precisely what we will do in ever-increasing numbers. Space is the next economic development zone, and while the human presence there will mostly be beautiful, we'll also be faced with thought-provoking issues. Imagine this:

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FOR IMMEDIATE RELEASE

Tycho/Clavius South, Lunaria (Sept. 15, 2023)

- - HumanGen, Inc., announced a major breakthrough today in its efforts to create human beings able to work on the lunar surface without the need for space suits or breathing apparatus. Using proprietary

recombinant cyberbiotechnology, a team of Indian, American, Russian, Japanese and South Korean scientists developed living skin that is impervious to vacuum, extreme temperatures and radiation, and lungs that manufacture oxygen from molecules released from regolith due to continuous solar bombardment. "This was not an easy accomplishment, and I'm very proud of our multinational team," said J. M. Molari, Vice President of Stellar Marketing. "Settlement of the Moon can now proceed at a rapid pace, decreasing the need for Earth citizens to make the dangerous pilgrimage here." While not yet planning to fully....

Do you believe this can't happen? Then consider a scenario closer to home, both in distance and time.

MSNBC website (Jan. 5, 2011)

The internationally known spammer E-Spore continues to evade authorities and flaunt anti-spam laws. Authorities believe the suspect has successfully hacked a U.S. high-speed, hyper-bandwidth, quantum laser geosynchronous satellite and is now able to penetrate all but the most heavily protected computers and server systems. This satellite poses an unprecedented threat. Government and corporate data security specialists believe that...

These fanciful examples illustrate how activities that are illegal, unethical and/or just morally repulsive on Earth may readily move into space. When this happens, how will humanity respond? Before you answer that, please consider that in the future "humanity" will not just include those living on Earth but those living on the Moon, on asteroids, Mars and in orbit. Will those living in space have the same interests as we Earth-bound folk? Will people living nearby in orbiting colonies and on the Moon have the same "we" perspective as those living further away on asteroids and on Mars?

VACUUM?

BY JEFF KRUKIN



SPACE: A MORAL VACUUM?

Last year's award of the Ansari X-Prize and the passage of the Commercial Space Launch Amendments Act are harbingers of an emerging "space economy." During the course of human development, civilization has moved from one type of global economy to another, and each of the varied activities or industries has been shaped by the existing overall economy. For example, thousands of years ago, humans lived in hunter-gatherer societies. Following this came agrarian, manufacturing and the current knowledge economies. As manufacturing blossomed, agriculture became a smaller and smaller portion of overall global economic activity, and entirely new industries developed to support a manufacturing economy. As the knowledge economy develops around the world and replaces manufacturing in some countries, we see indications of the same pattern. It is very possible that this transformation trend will continue, for if commercial space launch and habitat industries flourish they will surely enable entire new industries, and hence lead to the "space economy." Should this happen, the human settlement of space will affect all our lives, not just those who live in space. Many difficult questions will be raised, some of which I will consider in the rest of this article—first a few general principles, and then several specific concerns. By no means is this a complete list.

General Principles

Are all activities that are illegal in some or all nations on Earth also illegal in Low Earth Orbit (approximately 300 miles) and/or geosynchronous orbit (approximately 22,000 miles)? If so, who creates and enforces the laws, and at what altitude or distance from Earth do the laws apply, or cease to apply? More specifically:

When the first orbiting euthana-

sia facility permits terminally ill people to die peacefully with an unprecedented view of Creation, will this be illegal?

What about stem cell or cloning research performed in orbit, or on the Moon?

Human beings seek pleasure, and this includes illegal sex (prostitution) and illegal drugs. How long before we have the first orbiting brothel or opium den?

Will child labor laws be applicable on the Moon?

Will bigamy be permitted in mining colonies on distant asteroids?

Other activities are legal, yet considered to be unethical by many people. One example is the use of animals for medical research and product testing. When such testing facilities are placed in orbit or established on the Moon, will our perception of these activities change?

What about professions that require a license, such as physician, attorney, real estate agent and educator? When the first generation of humans is born on the Moon, will that society duplicate all the regulatory functions we're familiar with on Earth, or will they create an entirely new framework?

Specific Scenarios

Mining

Sea and land mining is regulated by national and international laws, and government organizations exist to create and enforce these laws. Will these laws be applicable when the Moon is mined for Helium-3 and platinum group metals, and the asteroids are mined for their resources? Will the United States Environmental Protection Agency have jurisdiction over American companies operating in space, or will new laws need to be passed? If new laws are required, will enough people be morally outraged about lunar strip mining so that Congress passes these new laws? Or will most people simply not care,

opting for the NIMBY ("not in my backyard") attitude?

Of course, this concern will be viewed quite differently by those generations born and living on the Moon. Will they clamor for the extension of Earth-bound environmental protection laws to the Moon, or create their own Lunar Environmental Protection Agency? Will Lunarians declare that lunar strip mining is unethical, yet asteroid strip mining ("C'mon, it's just a big rock") is perfectly acceptable? Just how far out will NIMBY operate? Will our sense of ethics expand as we extend our reach into space?

Citizenship

Let us say your company transfers you to its lunar research facility at Mare Imbrium, and your wife takes a sabbatical from her job and comes with you. You've been wondering how your tennis game would fare in low gravity, and your wife has been reading *The Zero-G Spot* and has her own curiosities. Nine months after arriving, your tennis game is as bad as ever, and you're the proud father of a new son.

You and your wife are citizens of Australia, you work for a Canadian company leasing facilities from a Russian research institute, and your son is born in a U.S. military hospital that serves all nationalities on the Moon. What nationality is your new son? Does he receive multiple nationalities and the privileges thereof, and thus have unethical advantages over Earthers with single nationalities? Or, is he a Lunarian and thus in need of a green card to visit Earth, and what are the ethics of this arrangement?

What about a child born on an asteroid-based mining facility?

Deep space society

Or let us say that it is seventy years in the future, and the first deep-

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space settlement has been operating for six months on Europa, the fourthlargest of Jupiter's moons. Four hundred men and women from 26 nations chose to establish the first extra-terrestrial settlement founded not for science or exploration, but solely to create a new society not bound to Earth's laws. Relying on decades-long advances in colonization technologies, the Europeans chose the Israeli kibbutz as their lifestyle and governance model—at first. However, several unanticipated problems have led to food shortages, water rationing and increasingly harsh living conditions. Too far from Earth to expect help, the settlers' very survival is at risk.

The progress of technology and distance from Earth's institutions led the Europeans to believe they could create humanity's first true Utopia. Instead, they regressed to institutionalized behavior that is completely unacceptable on Earth, yet seen as necessary for the survival of the settlement. Those responsible for food and water production are enslaved. Thirty-two people deemed to have the least crucial skills are terminated. All unmarried women are immediately paired with young men, married or not, to produce children.

While such decisions would be deemed unethical on Earth, are some or all of them acceptable on Europa if it is the only way to ensure the survival of most Europeans? Should Earth send a rescue fleet, even if the Europeans haven't asked for help? If a fleet is sent and all Europeans are returned to Earth, are their behaviors on Europa punishable under Earth laws?

This issue is as big as the universe itself, because it poses such deep philosophical and religious questions and is at the very heart of what it means to be human. Humans are natural explorers of all the inner and outer space we discover, and we do what our nature compels us to do. But just because it is our nature, is it ethical? In the act of exploring space and settling other celestial bodies, we are bringing life to other worlds. Should we be doing this? Is this our cosmic purpose, to spread life throughout what may otherwise be a lifeless Universe? And if we discover microbial life on another world, should we be hands-off and leave that one to God or, perhaps, a Kubrickian obelisk?

On a more practical level, why not use the abundant resources of space to decrease our environmental degradation of Earth and improve the global standard of living? Alternately, should we clean up our act, and our home planet, before spreading out into the solar system?

Many people believe we shouldn't spend money on space exploration until we solve all the problems on our own planet. Sounds reasonable, but this offers little more than false hope.

Just when will all our problems be solved? How can this be measured, and who declares this accomplished? How many nations, governments, companies, organizations or people do you know that have solved all of their problems? Humanity isn't going to solve all its problems, ever. We are too dynamic, always overcoming predicaments yet creating more at the same time, and forever continuing this cycle as we endlessly evolve. We go into space for the same reasons that humans have always explored: to find resources and freedom, to create better lives. If humans didn't leave home until all was well, all six billion of us would still be in Mesopotamia, crowded and miserable.

Lunar visionary Kraft Ehrlicke said it best in 1970: "While civilization is more than a high material living standard, it is nevertheless based on material abundance. It does not thrive on abject poverty or in an atmosphere of resignation and hopelessness. Therefore, the end objectives of solar system exploration are social objectives, in the sense that they relate to or are dictated by present and future human needs." With a ceaselessly growing global population requiring ever more resources, human survival and prosperity require not just the exploration of space, but also its settlement and economic development. It's really that simple.

So, rather than ask if it's ethical to explore, settle and develop space, the more valid question may be, "Is it ethical to not extend the human presence throughout the solar system?" Asked another way, is it more ethical to never leave Earth and continue despoiling our home as we seek to provide a comfortable life for a constantly growing population? Or, how about this: We are the only species containing individuals who believe their own species deserves to stagnate and suffer rather than expand into space for reasons described above. How ethical is it to condemn future generations to this? Finally, with massive asteroids barely missing us left and right and knowing that somewhere out there is a monster with our address, does it make sense to keep all our embryos in one womb?

Go Big or Stay Home

When I learned to play the card game Spades in college, one of the first things I was taught was to take risks and play to win—or as one friend put it, "go big or stay home." The same attitude applies to human activity in space. If we don't go big we might as well stay home, otherwise we're only fooling ourselves. The questions, issues, challenges and concerns will always be part of the hand we are dealt. This is nothing more than the Universe giving us countless opportunities to learn and grow. If we don't accept these gifts, who will? If not now, when? **A**