We are fishing out the oceans, killing off the wild animals, cutting down the forests, denuding the mountains, using up the fresh water, even turning land into desert.

We are polluting the oceans, the fresh water, the land, the air.

We waste most of the energy coming from the sun and from the earth. Instead of using the energy to make capital investments that benefit the whole earth, such as pollution remediation or pollution prevention, much of the energy is invested in weapons and destruction because we love killing and war.

We live in a fantasy world. Almost nothing has any real meaning. We have fantasies about nations, fantasies about wars, fantasies about government, fantasies about politics, fantasies about sports, fantasies about science, fantasies about religion.

We have fantasies about space empires that we hope to make true.

In summary, our broadcasts show that we have no redeeming value.

There are three possible outcomes:

The surface of the earth will be sterilized, killing us and everything else on the planet, boiling away the atmosphere and the oceans, leaving a dead planet like Mars. This is the simplest approach and it can happen at any moment once our television transmissions are analyzed.

Or, all humans will be exterminated while the rest of the planet is left intact to recover, including the green hills. This is a much more difficult treatment. If aliens ever land here, it will be to kill us.

Or, the cancer will mutate and live in equilibrium with the planet. We can give up our space empire fantasies (but not space travel) and try to convince our neighbors that the earth has been cured. If our television broadcasts indicate that the earth is approaching equilibrium, we may be spared.

We need to adopt a population goal of, say, one billion people, where each of those billion can live a productive, reasonably prosperous, healthy life. Until the population stabilizes, women should have no more than one child (except for twins and triplets). People should be allowed to die. Dying is normal and healthy. People should be allowed to take risks. We should repair the damage to the oceans, the forests, the land, the air. Every year we and the earth should be richer than the year before because of investment in the future.

The title derives from a story by Robert Heinlein that I read as a child.

THE COOL, GREEN HILLS OF EARTH

Robert L. Kurucz

Harvard-Smithsonian Center for Astrophysics
60 Garden St, Cambridge, MA 02138

Cool, green hills are an unusual feature that is found on fewer than one planet in one hundred thousand. The nearest other example is 71 light years from earth. They are rare because of the large number of steps required in their manufacture. In the case of the earth, convection in a molten core pushes or pulls pieces of the surface into collisions with each other and forms mountains. Water in oceans on the surface evaporates into the atmosphere, then rains down on the mountains, and then flows back into the oceans. The mountains erode into hills. Meanwhile life has to begin and evolve into green photosynthetic plants that like to live on hills.

Green hills are the environment least threatening to us. City dwellers, living in a background of constant noise, have to worry about being crushed by machines. On oceans there is drowning; in deserts there is thirst and heat; on ice, freezing; in space, losing air and radiation storms.

In addition, cool, green hills present a psychologically comfortable scale. In the foreground are individual plants, trees, flowers, shrubbery, grasses. In the middle ground are wooded hillsides, fields, meadows. In the background is a scalloped green horizon of rolling hills. There can be broad vistas across river valleys. It is easy to feel and understand how one is connected to the earth from one view to another. In other environments there can be no view at all, or a flat horizon that isolates the viewer. Even worse, in space there is no horizon. One is both unconnected and unprotected.

The second unusual feature of the earth is that it is covered with a cancer that is rapidly destroying the surface of the planet. The cancer will eventually destroy the green hills and everything else. Planetary cancers are uncommon; also on the order of one per one hundred thousand planets. They are normally self-limiting and die out. On earth the cancer has evolved to the point where it is hoping to metastasize to other planets. If the cancer succeeds it will be able to spread throughout the whole galaxy in less than one million years, destroying planets as it goes. Civilizations that already occupy the galaxy do not appreciate metastasizing cancers and exterminate them as soon as they are detected.

We have been broadcasting television out into the nearby galaxy for fifty years. We have broadcast the following information about ourselves:

We do not wish to control our population; it is growing exponentially and now stands at six billion. Many people advocate unlimited growth. We even use fertility treatments to increase the population. We do everything possible to keep people from dying naturally (unless they are poor).

THE COOL, GREEN HILLS OF EARTH

Robert L. Kurucz
Harvard-Smithsonian Center for Astrophysics

December 31, 1999