Time to Go?

Should we begin the great task of our species—colonising space?

We are accustomed to the concept of colonising the solar system and populating the universe. We think of it as a project for the distant future but perhaps we should be getting on with it. I see three reasons, any of which might suffice, for us to begin space colonisation. They are:

1. **material necessity**: limited resources will not allow us to live on Earth forever;
2. **psychological need**: we lack purpose on Earth and must move on;
3. **destiny**: space colonisation is an imperative of the universe itself.

1. Material necessity. At some stage we must leave Earth if we are to maintain our technological civilisation. Our culture uses the planet's raw materials and damages its ecosystems. Capacities may already be running down: our measures to limit population, restrict pollution and recycle resources show we are aware we are not as rich as we used to think. Total recycling is impossible so conservation postpones, rather than solves, the resources and pollution problems. Sometime we must go.

Perhaps the time is now. After hundreds of thousands of years of starvation, disease, superstition, and cruelty, industrial societies reached the approximate human potential of health, comfort, security and liberty. Having achieved this for a quarter of mankind for half a century, the Earth—land, sea and air—is indicating it can't cope. What hope it can support this standard of living expanded to the other three quarters? For how long?

Earth's dwindling resources might be supplemented with imports of material and energy from space but one-way transfers would further stress the environment. Ultimately, the surface of a planet is not a suitable habitat for a technological civilisation. Some people will always live on Earth and some may live on other planet surfaces, however if our species is to flourish and expand to trillions, it must mostly live in space. This would allow Earth to be renovated and restored.

If Earth-based economic resources have peaked and are running down, we should be treating them as investment capital. They should not be dissipated propping up a few more generations of Earth's wealthy but should be invested in space colonisation. If we have outgrown the planet our priority should be to leave it. Leaving will be expensive and if we wait till resources are exhausted we won't be able to afford it.

In space, the supply of material and energy is infinite and artificial nuclear energy may be safely employed. The prospect is of boundless wealth. In space there are no limits to growth.

The outlay to establish the first space cities would be a substantial fraction of our civilisation's current assets. It may exceed the cost of the twentieth century wars and arms races. The expense is because the technology and biomass have to be lifted against Earth's gravity. Actual construction materials could mostly come from the moon. The mine on the moon might itself cost more than any previous construction project but the cost of launching material from the moon would be lower than from Earth.

The first cities could be built at the “Lagrange points” (places where gravity balances out) synchronous with the moon’s orbit around the Earth. They would have to be wheel- or cylinder-shaped vessels rotating to simulate gravity. We should expect it to take a couple of generations for the first colonies to become economically viable; it may take centuries before they become substantially independent of Earth-based infrastructure.

The difficulties of arranging for millions to migrate and live in space are daunting but ultimately there is no alternative. If humanity as a whole is still becoming wealthier, we may be able to put it off but if we are now getting poorer then we must start the departure. If we don’t act while we are rich, we won’t succeed. If we don’t succeed, the drawn-out death convulsions of our civilisation will not only reduce humans to wretchedness but will also devastate Earth’s ecology and exterminate many animals and plants. If we succeed, the biological potential is unlimited.

2. Psychological need. Humans are not content just to be born, to exist, and to die. We differ from other animals in that we seek purpose to life in addition to status advancement and procreation.

What, nowadays, do people dream of? What inspires and engages them? The days of the explorers and frontier settlement are long gone. The various experimental utopias are now historical curiosities. The old incentives of serving gods and ensuring life after death have vanished. Tribalism is a dead end, the ideological alternatives of fascism and communism have been seen to fail and autocratic government is not stable. For stability, secular democracy is the only workable system and in democracies under no existential threat, nationalism and soldiering are pointless and fall into disrepute. Static, aging populations, economic torpor and wealth itself have made “nation-building” sound quaint. There is nowhere to go.

Nowhere to go except to decay. The developed countries are marking time; their development stopped fifty years ago. They have little potential for improvement and much potential for trouble: unemployment, family dysfunction, addiction, depression, suicide, crime, epidemics, political extremism, terrorism. We no longer expect children will live better than their parents and the developed societies exist from year to year with no vision and no plan except to worry about impending problems.

What is there to look forward to? A better shopping experience? Exciting food and fashion? Despite an unprecedented range of entertainments, modern society is predictable and dull. Where is purpose, ambition, adventure, excitement, danger? In commerce? In an occupation? There can be dignity in making a living but the striving which distinguishes humans from other creatures—wonder, honour, progress, grandeur—transcends the provision of food and shelter. The only remaining echo of a stirring challenge is sport.

As an enterprise, space colonisation would fuel dreams forever. Departure is the ultimate test of Darwinian fitness. Can the species act to ensure its survival? Will it bequeath its descendants the opportunity of worth-while lives, offspring without limit, and inexhaustible wealth?

3. Destiny. Moving into space has implications transcending our resources, our dreams, and our species. After four billion years of evolving life, this is the first chance to escape which Earth’s progeny have had; humans would not go alone: thousands, or millions, of other organisms would accompany us.

As far as we know this is also the first chance for the universe. Unless intelligent life arises elsewhere, it will be the universe's only chance. In that case, if our technological civilisation is now in decline, then this moment—a few decades—is the only opportunity the universe has to become conscious: a few decades among the unimaginable billions of past and future years. This may be a pivotal moment, not just for humanity and for Earth, but for the cosmos.

Though we evolved on Earth we do not necessarily belong to it. Our origins rest on three great events, or advents: *time*, *life* and *mind*. 13.8 billion years ago time began; matter and energy came into existence and the universe blazed, smelting chemical elements in accordance with the laws of physics. The second event occurred four billion years ago when circumstances on our planet gave rise to self-replicating carbon molecules. Life—complex, radiation-driven interactions of the chemical elements—occupied and moulded the surface of the Earth.

Recently—a mere million years ago—life gave rise to mind, a mysterious new power operating within the old laws of carbon life and physics. With mind the universe began to understand itself and in the last two hundred years mind has transformed, via technology, Earth's surface. We humans are the universe's experiment in intelligence and now, suddenly, our future and the future of all life depends on us.

Whether or not life and mind spread through the universe is in our hands. It could be that intelligence has flowered and withered on other planets with wistful inhabitants impotent before insuperable engineering problems. The technical feasibility of escaping the home planet depends on circumstances. Our departure is facilitated by Earth's modest size, by its dense atmosphere, and by the lucky size and position of our moon which provides stable Lagrange points as stepping stones. We have no insurmountable physical obstacles.

If we fail it will be our own fault. The obstacle is politics. The start capital is far beyond private initiative and probably beyond any single country. The United Nations has no relevant charter so we would need a new supranational organisation with unprecedented authority. Humanity's greatest task confronts us; if we live ten billion years and spread to the ends of creation, we will never face another mission so crucial. Earth's leaders, absorbed in their quarrels, have never heard of it.

The human species, carrier of the intelligence of the universe, may have arrived at the fork in the road. We must pay a toll to take the high road but it leads to unbounded prosperity. To continue on the low road is cheaper and easier but leads to squalor and ultimately to oblivion. The danger is that by the time it becomes obvious that the shadows are deepening, turning around might be impossible.

The present outlook for the Earth's teeming humans is sombre: increasing social and material struggle in the wealthy countries, elsewhere billions in poverty. Is that also the long-term outlook? If it is, and if we don't start our departure soon, we will condemn our species to acrimonious extinction—and to the bitter realisation that we had our chance and missed it and lost everything.

If we succeed in leaving we will have galaxies at our disposal and we will never die.□