

Space, World Government, and a ‘Vast Future’ for Humanity

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Posted: 4 August 2017

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“We can never again be a squabbling band of nations before the awful majesty of outer space”

— Adlai Stevenson [1]

1. Introduction

In *Union Now*, the classic argument for the federation of the Western democracies as a step towards world government, Clarence Streit borrowed a phrase from Lincoln to make the point that if we could unify the planet politically then we would potentially enable a “vast future” for humanity [2]. As someone who grew up with the space age, and who now makes a living as a planetary scientist, it has long seemed to me that the exploration and colonisation of space would form a significant part of such a future, and that somehow these very different, but equally forward-looking, aspirations for humanity’s future will prove to be deeply connected [3,4]. Such a connection has of course also been noted by others, although perhaps more often in science fiction [5] than in serious academic discourse. One contemporary international relations scholar who does take the connection seriously is Daniel Deudney [6], although, as will become apparent below, I think Deudney’s perspective is unnecessarily pessimistic.

Of course, space exploration and world government don’t really belong in the same category: achieving world government is a political aspiration, whereas space exploration has been an on-going activity for over half a century. Presumably this activity will continue at some level regardless of the world’s geopolitical arrangements. That said, from where we stand at present, the kind of large-scale space activity required to create a future space-faring civilisation is just as aspirational as is the creation of a world government. Moreover, neither is likely to be an imminent development and, assuming that they occur at all, the evolution of both seems likely to play out over similar, possibly century-long, timescales. This co-temporality could provide significant opportunities for the development of synergies between space development and world

government, even though these quite different aspirations for the future could in principle occur independently, each driven by strong imperatives of their own.

The social, economic and political imperatives for world government will presumably be familiar to readers of *The World Orders Forum*, so there is little need for me to reiterate them here (see references [7] and [8] for excellent historical overviews, and [9] for a compilation of recent thinking on the subject). My own view, doubtless in common with other readers, is that addressing such transnational challenges as ensuring world peace, stimulating international economic development, mitigating climate change, minimizing biodiversity loss, and managing the global commons would all benefit from a global tier of government. Individually, and still more collectively, these pressing global problems are certainly severe enough to justify consideration of world government as part of their solution, quite independently of any thoughts of outer space.

As readers of these pages may be less familiar with the positive arguments in favour of space exploration and colonisation, I will briefly review those here, and then move onto a discussion of where I think the synergies lie between world government and space activities.

2. The case *for* space expansionism

Deudney [6] has defined ‘space expansionism’ to be a philosophy that views “human expansion into space [as] desirable, and perhaps even inevitable” and that “large-scale space activities can solve a variety of important Earth problems.” Within the framework of this definition, I would be happy to class myself as a ‘space expansionist’, with the caveat that I do not think expansion into space (or anything else in human affairs) can be claimed to be inevitable – any such outcome will depend on human choices. Deudney himself is not a space expansionist and identifies several dangers associated with it, leading him to urge that we do *not* choose such a future.

To my mind, Deudney’s argument ignores a number of positive arguments in favour of a large-scale programme of space exploration and colonisation. I have discussed these in various previous publications [e.g. 3,10,11], and briefly summarize them here:

2.1 *Development of a space economy.* The evolution of a space-faring civilisation, perhaps including human colonies on the Moon and Mars, would rely on the development of a space economy utilising the material and energy resources of the solar system [e.g. 12-15]. These resources are, to all intents and purposes, infinite, and the development of such an economy can hardly fail to benefit Earth’s economy also. Potential benefits include the creation of entirely new industries such as space tourism and asteroid mining (with associated increased employment and tax revenues), the harvesting of sunlight to supplement Earth’s energy needs, and the possibility of moving some environmentally damaging and polluting industries off Earth altogether. Moreover, the development a space economy would result in the creation of space-based transportation, energy, habitation and communications infrastructures that would facilitate multiple additional aspects of human activity in the space environment.

2.2 Pursuit of scientific knowledge. Science has been a major beneficiary of the space age. In the sixty years since the discovery of Earth's radiation belts by the first artificial satellites, new knowledge has poured down from spacecraft operating throughout the solar system. Major scientific disciplines like astrophysics and planetary science have undergone paradigm-changing revolutions as a consequence, and it is sobering to contemplate just how limited our knowledge of the universe would be without access to space. However, there are growing concerns that the current rate of scientific discovery is unsustainable with current funding models. As space missions become more complex their cost grows faster than do scientific budgets, or even the Gross National Products of participating countries. Ultimately this must result in space science hitting a 'funding wall' which will curtail future discoveries [16]. On the other hand, access to the infrastructure provided by a space-faring civilisation would be very enabling for scientific research, even if such an infrastructure is not developed with science primarily in mind [16-18]. For example, just as telescope construction on Earth relies on the availability of a commercial construction industry, so future large space telescopes will be enabled by the existence of a space-based equivalent, even if most of its business relies on commercial activities, such as building orbital hotels or satellite solar power stations, quite unrelated to science.

2.3 Wider cultural and intellectual benefits. Moving out into the universe will inevitably bring humanity into contact with situations and environments never before encountered in human history, and which *cannot* be encountered as long as we remain Earth-bound. In addition to new scientific knowledge, such new experiences can hardly fail to provide novel stimuli for other intellectual endeavours, for example in philosophy and the arts. Twenty years ago the philosopher Francis Fukuyama [19,20] argued that our world is in danger of becoming politically and culturally homogenized and, although subsequent events indicate that this is proceeding more slowly than he perhaps envisaged, some of the trends Fukuyama identified seem likely to continue. Fukuyama himself was ambivalent towards this process, which he infamously saw as leading to 'the end of history', because he believed it would mean an end to human achievement and creativity. As he put it [19]:

"The end of history will be a very sad time. The struggle for recognition, the willingness to risk one's life for a purely abstract goal, the worldwide ideological struggle that called forth daring, courage, imagination, and idealism, will be replaced by economic calculation, the endless solving of technical problems, environmental concerns, and the satisfaction of sophisticated consumer demands. In the post-historical period, there will be neither art nor philosophy, just the perpetual caretaking of the museum of human history."

As I argued an initial response to Fukuyama's ideas [4], an ambitious programme of space exploration is ideally, and perhaps uniquely, suited to avoiding this rather depressing vision of the future. Human expansion into the solar system (and perhaps eventually beyond) would present a vast new field of activity with literally infinite potential for discovery and intellectual stimulation on multiple levels – certainly a far richer range of stimuli than we could ever hope to experience if we never leave our home planet.

2.4 Long term survival of humanity. Many of the present threats to human civilisation, and even human existence, are of our own making. Expansion into space will not directly help us address these threats and, as Deudney notes [6], may exacerbate some of them. Rather, mitigating and

managing these self-imposed risks requires progress on the development of appropriate social and political institutions here on Earth (and this is indeed one of the principal drivers for world government). However, not all the existential threats facing humanity can be contained by creating appropriate political institutions on Earth. Global pandemics resulting from naturally evolved, or artificially created, pathogens might pose such a threat in the very near future. On longer (thousand- to hundred thousand-year) timescales, civilisation-destroying events such as asteroid impacts and the eruption of super-volcanoes appear inevitable (and, given their stochastic nature, could occur sooner). On much longer (admittedly hundred million year) timescales, the slowly increasing luminosity of the Sun will place increasing stress on the ability of Earth's biosphere to support complex life. Some of these threats may be imminent, whereas others are clearly very long-term, but it must logically be true, as pointed out by L.R. Shepherd [21] before the space age had even begun, that "humanity dispersed over many worlds would appear to be more secure than humanity crowded on one single planet." Moreover, a spacefaring civilisation would have the capabilities actively to mitigate some potential cosmic threats that an Earth-bound civilisation would not, for example the ability to deflect in-coming asteroids or to construct giant sunshades to protect Earth from the ever-increasing solar luminosity.

Deudney [6] has drawn attention to the possible dangers of permitting large-scale industrial capabilities in space, owing to the risk that they might be used for destructive ends. It is certainly true that any society capable of changing the orbits of asteroids, for example, would have millions of times more potentially destructive power at its disposal than the world's current nuclear arsenals [22]. However, I agree with Carl Sagan [23] that this is more an argument for the effective *governance* of a future space-faring society than for not creating one in the first place. If we turn our backs on the opportunity to create a space-based civilisation we may mitigate some potential risks, but we will also fail to reap the benefits sketched above (see also the discussion by Gonzalo Munévar [24], who comes to similar conclusions). Indeed, I would argue that if we follow Deudney's advice the whole future of humanity would be needlessly impoverished, both economically and culturally, while at the same time essentially guaranteeing eventual destruction by a natural meteorite impact or some other cosmic catastrophe.

Having weighed the various considerations, Sagan [23, p. 326] concluded that in order to secure our own survival

"eventually we must establish a formidable human presence throughout the inner Solar System ... [but] to do so safely we must make changes in our political and international systems."

There is an obvious link here to world (and, indeed, interplanetary [25]) government, to which we will shortly turn. In truth, however, we will need to get our political systems working properly on Earth in any case: a nuclear war would be less destructive than a space war waged by hurling asteroids around, but it could nevertheless be destructive enough to destroy our civilisation. This ought to be sufficient incentive to develop international institutions that can minimise the risk of war, including in the present context the development of a world government, irrespective of what may happen in space.

3. Synergies between space expansion and world government

Given that the creation of a space-faring civilisation and a world government would both be beneficial future developments, with strong imperatives for each, it is perfectly possible to envisage them developing independently. Nevertheless, summarizing some of my previously published work [3,4], I think it is possible to identify several mutually reinforcing synergies that may enhance the prospects for both, especially given that they may co-evolve over similar timescales.

3.1 Benefits of world government for space expansion

· *Geopolitical stability.* Building a space-faring civilisation will require governmental and corporate entities to sustain major projects for many decades, and perhaps centuries. The organisation of today's world is not conducive to such long-term planning, as governments are constantly distracted by a host of domestic and foreign policy issues. If outer space is to occupy governments to the same extent that they are occupied by (say) foreign affairs, then these other distractions must somehow be made less urgent. Moreover, private entities will have little incentive to invest in long-term space projects unless they can be sure that the political and financial environment is sufficiently stable that their investment will pay off decades in the future. As one of the main objectives, and perhaps *the* main objective, of a world government would be to ensure geopolitical stability, it follows that space development, along with other long-term projects on Earth itself, would be a beneficiary. As noted above (and to address some of the concerns raised by Deudney [6]), once space colonisation gets going in earnest it will be desirable to expand a world government into an interplanetary government in order to prevent conflict between space colonies and between the colonies and the Earth. I have suggested elsewhere [25] that the nature of federalism is such that a *federal* world government would be uniquely well-suited to being extended in this way.

· *Legal oversight of space activities.* In addition to providing a stable geopolitical environment within which space development can occur, it will be desirable to provide legal clarity on space activities. For example, if commercial entities are to be involved in extracting space resources they will need to be confident that they have legal title to the fruits of their investment, because otherwise such investment may not occur [26]. Moreover, there will be some activities in space that will need to be restricted because they would pose a potential hazard (changing the orbits of asteroids might be an example), or because they would negatively affect locations or phenomena of scientific importance. To the extent that such activities are regulated today they are governed by a handful of international treaties negotiated under UN auspices, most notably the Outer Space Treaty (OST) of 1967 [27]. However, the OST is woefully inadequate to manage the large-scale space activities envisaged here, not least because many activities that are likely to be important in the future (e.g. the commercial exploitation of space resources, or space tourism) were not envisaged when it was drawn up. Space is a transnational domain, and the current approach of trying to govern space activities by coordinating different national jurisdictions with reference to an out-of-date treaty is unlikely to work well in the longer term. On the other hand, one of the motivations for establishing a world government is to better manage the global commons, and a world (later interplanetary) government would thus appear to be the most

logical and legitimate means of managing extraterrestrial activities on behalf of humanity as a whole.

· ***Provision of resources for space development.*** In addition to long-term economic and political stability, building a space-faring civilisation will require substantial material and intellectual resources. In the early stages, before extraterrestrial resources can themselves make a significant contribution, these resources will have to come from some combination of economic growth and a diversion of resources from other sectors of the world economy. The stability provided by a world government would be expected to help with global economic growth, rendering a world space programme more affordable. More importantly, however, by eliminating the need for national military expenditures, a world government would liberate the approximately 8% of global government expenditures (or ~2.2% of the Gross World Product [28]) that is currently consumed by this largely unnecessary, dangerous, and unproductive sector of the world economy. Presumably, much of this ‘peace dividend’ would (and should) be devoted to global economic development. However, given the extent to which the ‘military-industrial complex’ is embedded in many developed economies, even a world government may find it desirable to divert some of the liberated arms budgets into space development just to maintain employment and innovation in these key industries. I will return to this ‘swords into spaceships’ [29] idea below, where I argue that it might also help a world government overcome resistance to disarmament by industrial vested interests.

3.2 Benefits of space expansion for world government

Readers of *The World Orders Forum* will presumably be most interested in what space development might do to make world government more likely, rather than the other way around, and I think we can identify at least five, mutually reinforcing, possibilities under this heading:

· **Focus for international cooperation.** In his speech on *The Way to Peace*, delivered in New York on 12 September 1946, then US Secretary of Commerce (and later Progressive Party presidential candidate) Henry Wallace made a point about world government that sadly appears as true now as it was then [30]:

“Practically and immediately, we must recognize that we are not yet ready for World Federation. Realistically, the most we can hope for now is a safe reduction in military expense and a long period of peace based on mutual trust....”

In creating a positive geopolitical environment, from which a world government might plausibly evolve, it will be helpful to build confidence between nations by increasing the range and depth of international collaborative activities (see, for example, Buchan et al. [31]). From the point of view of enhancing international solidarity it will be especially desirable that such cooperation is achieved in areas that are highly visible to the global public, and space exploration is an obvious candidate. Indeed, the most positive aspect of international space policy over the last several decades has been the move away from Cold War competition towards a more collaborative approach. For example, fifteen nation-states collaborate on the International Space Station (ISS) programme, and the continuing development of the Global Exploration Roadmap [32] by fourteen national space agencies (including that of China) gives some confidence that this trend

will continue. Space exploration is not the only field of international activity that can help build confidence between nations, but it has a higher public profile than many. The more the world's population is able to witness representatives of different countries working together towards common ends, often under challenging and dangerous conditions, the easier it will be to generate the kind of international solidarity that Wallace perceived to be a precondition for world government.



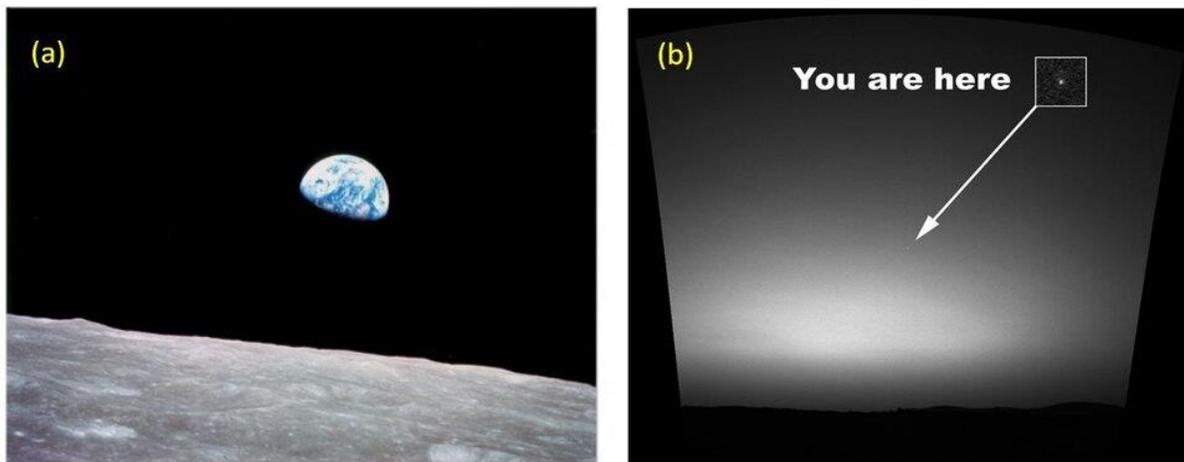
The International Space Station is a collaboration of 15 nation-states and provides the strongest example to-date of international cooperation in space. Such high-profile cooperation can help build bridges between nations in a way that can only be helpful on the road to world government (image: NASA).

· **Swords into spaceships.** An ambitious space programme may also be able to help address the other pre-requisite identified by Wallace, namely “a safe reduction in military expense.” Of course, the primary means of achieving disarmament must be to reduce international tensions (hence the need for confidence building collaborative activities) and eventually to do away with sovereign national governments altogether, but there are additional considerations. Ever since President Eisenhower first drew attention to the existence of the “industrial-military complex” [33], it has been apparent that large-scale disarmament may pose restructuring difficulties for many developed economies. Indeed, it is possible (perhaps even likely) that the vested interests of the affected industries might push back against disarmament even if the

international situation comes to warrant it [34]. As I have argued elsewhere [29], providing an alternative business for these industries may be helpful in achieving a transition to a more peaceful world. Given that many of these industries, especially in the aerospace sector, are currently engaged in both the production of high-tech weaponry and in building the hardware required for space exploration, a switch in favour of the latter would minimise disruption to this sector of the economy. This in turn may reduce the risk of political and corporate opposition to disarmament. Moreover, even if a world government is established, it will presumably have good reasons to maintain employment and innovation in high-tech industries and, in the absence of a military sector of the economy, a growing space industry may be an attractive alternative.

· **A cosmic perspective.** Among the strongest, if implicit, arguments for world government are images of the Earth taken from space – a perspective that only space exploration can provide. A society that is rigorously exploring the solar system, and building colonies on the Moon, Mars, and asteroids, can hardly fail to be aware that Earth is a very small planet when viewed in its cosmic setting. This is a perspective that astronauts have often mentioned, and it is worth quoting one here [35]:

“You look down there and you can’t imagine how many borders and boundaries you cross, again and again and again, and you don’t even see them. There you are – hundreds of people in the Mid-East killing each other over some imaginary line that you’re not even aware of And from where you see it the thing is a whole, and it’s so beautiful. You wish you could take one in each hand, one from each side in the various conflicts, and say, ‘Look. Look at it from this perspective....’ ”



The cosmic perspective: (a) Earthrise over the lunar surface, photographed by the crew of Apollo 8 in December 1968. (b) The Earth photographed from the surface of Mars by the Mars Exploration Rover Spirit in March 2004. Such images powerfully reinforce a ‘cosmic perspective’ that can have a unifying influence on human affairs (images courtesy of NASA).

The social, cultural and psychological importance of this perspective has been noted by multiple authors [e.g. 23,36,37], and in his book *The Overview Effect* Frank White [37, p. 102] goes as far as to suggest that:

“it is time for the influence of space exploration on human consciousness to be seen as a legitimate justification for investing in it.”

It seems reasonable to suggest that the greater the number of people who go into space, and who know people who live and work in space, and the more commonplace images of Earth from space become, from ever greater distances, the wider this perspective must diffuse through global society. One may expect that increasing awareness of this cosmic perspective will gradually gnaw at the minds of political leaders (as it clearly did in mind of Adlai Stevenson, former US Ambassador to the United Nations [1]), and the minds of the wider public, until it leads to the emotional realisation that in some sense Planet Earth *ought* to be politically unified. As I have discussed elsewhere [3], a world government will want to encourage new, global, visions of humanity to supersede politically divisive nationalistic ones, and the cosmic perspective provided by space exploration is uniquely suited to this purpose [38].

· **Avoiding the ‘End of History’**. I argued above (Section 2.3) that an ambitious space programme may fulfil an important societal function by providing humanity with external sources of cultural and intellectual stimuli. Although I believe this will prove to be a benefit of expanding into space regardless of whether there is a world government or not, I think that these considerations may prove to be especially attractive to a future world government. Despite all the practical and security benefits, by making the world a safer and less anarchic place a world government would remove some of the sources of purpose and adventure that national competition and military conflict have (arguably) provided in the past. Indeed, if we are not careful, life under a world government might begin to resemble Fukuyama’s somewhat gloomy view of the ‘end of history’. Fukuyama himself [20. p. 67] identified the European Community (now the European Union) as an “institutional embodiment of the end of history” and, unless policies are implemented to prevent it, this might prove to be even more true of a future world government. Moreover, some influential thinkers have gone so far as to suggest that, owing to what they saw as an instinctive human need for excitement and adventure (even if only experienced vicariously), non-violent alternatives to military conflict will need to be found if peace is to endure. Bertrand Russell [39, p.65], essentially reiterating William James’ [40] ‘moral equivalent of war’ argument, put it this way:

“if the world is ever to have peace, it must find ways of combining peace with the possibility of adventures that are not destructive.”

If nothing else, the exploration and development of space will constitute a grand, *non-destructive*, human adventure which may help satisfy this psychological requirement. Given that the universe is essentially infinite in extent, its exploration and colonisation has the potential to provide a safety valve for human (and post-human) energies into the indefinite future, and this may prove be of considerable social value to a future world (and later interplanetary) government.

· **Space resources.** In Section 2.1 I drew attention to possible economic benefits of utilising space resources, which I argued will accrue to the world economy whether there is a world government or not. However, paralleling the socio-cultural arguments outlined above, I think there are reasons to believe that accessing space resources will be of particular interest to a world government. The major economic tasks facing such a government will presumably involve restructuring the world economy along lines of sustainable development and raising living standards in the world's poorer regions. However, even while engaged in these tasks, those responsible for a world government would be wise to keep an eye on the underlying resource base of the world economy. By the end of the 21st century world population is likely to be in the region of 11 billion [41] and, ideally, all these people will need to be provided with a decent standard of living and life expectancy. Crucially, this will need to be achieved without catastrophic damage to Earth's natural environment and, presumably, maintained *indefinitely*. This is a very tall order for a planet with finite resources [e.g. 42-45], but access to the resource base of the solar system could help by opening a previously closed planetary economy to external supplies of energy and raw materials [12,13]. Given proper management (e.g. by increasing energy efficiency, further development of renewable energy sources, and implementation of large-scale recycling), the world economy may be able to delay reliance on extraterrestrial resources, or, given new technological developments, perhaps avoid them entirely (but note that the rather pessimistic projections of *The Limits to Growth* study of the early 1970s [42] have so far proved to be surprisingly accurate [43], so complacency is not warranted). In any case, if a transition to extraterrestrial resources becomes necessary, and is to occur smoothly, then significant infrastructural investment will be required in advance. A responsible world government might therefore view the development of a space infrastructure to be a worthwhile, and perhaps essential, investment in the long-term future of the world economy.

4. Summary

Strong arguments can be identified to support both world government and the creation of a space-faring civilisation. These two ambitions for the future of humanity need not necessarily be connected, and in principle either could proceed without the other. However, if both do come to be realised, there seems a strong likelihood that their development will occur over a similar timescale (say the remainder of the 21st century), raising the possibility of co-evolution between them. I have argued here that strong synergies between world government and space development can easily be identified, increasing the likelihood of such co-evolution.

Specifically, space development would benefit from the geopolitical stability and economic resources provided by a world government, while a world government would benefit from the unifying cosmic perspective, sources of cultural and intellectual stimuli, an outlet for (often destructive) human energies, defences against natural cosmic hazards, and, eventually, unlimited supplies of energy and raw materials resulting from space development. Harnessing these synergies might hasten the creation of *both* a world government and a space-faring civilisation, and truly open up a "vast future" for humanity.

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- [5] Perhaps most notably in the *Star Trek* universe created by Gene Roddenberry (TV fiction, first broadcast in the United States on 8 September 1966), where a federal government exists not only on Earth but has been extended to include non-human civilisations on other planets. Interestingly, in the *Star Trek: Next Generation* episode "Attached" (written by Nick Sagan and first broadcast on 8 November 1993) the initial formation of a world government is said to have occurred in the year 2150 – let's hope that that is slightly pessimistic!
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- [37] White, F. (2014) *The Overview Effect: Space Exploration and Human Evolution*. Third edition, Library of Flight, American Institute of Aeronautics and Astronautics, Reston, Virginia.
- [38] See, for example, Benedict Anderson's *Imagined Communities* (revised ed., Verso, London, 1991; p.6) where he characterises nations as "imagined communities" because "the members of even the smallest nation will never know most of their fellow members ... yet in the minds of each lives the image of their communion." This characterisation was taken up by Eric Hobsbaum (*Nations and Nationalism Since 1780*, Cambridge University Press, 1990; p. 91), who pointed out that throughout history states have had "every reason to reinforce ... the symbols of 'imagined community' wherever and however they originated." A world government is not likely to be any different in this respect.
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