Interplanetary Federalism: Maximising the Chances of Extraterrestrial Peace, Diversity and Liberty

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> *Governments and States are provisional things, and they can be and must be modified to meet the change and expansion of human needs.*
>
> H.G. Wells (1922; p. 308)

> *Since society is essentially federal in nature, the body which seeks to impose the necessary unities must be so built that the diversities have a place therein.*
>
> Harold Laski (1967; p. 270)

Abstract

I propose that a federal system of government, able to implement the principle of subsidiarity on interplanetary scales, will be the most appropriate form of political organisation to guide the future colonisation of the Solar System. Only a federal system will simultaneously satisfy the three key criteria of (1) accommodating and protecting social and cultural diversity among Solar System colonies; (2) minimising the risk of conflict between these diverse colonies and with the Earth; and (3) protecting the rights and liberties of individual human beings throughout the Solar System. No other form of political organisation is likely to leave humanity in a better position to exploit the opportunities, and minimise the risks, associated with building a Solar System-wide civilisation.

Keywords: Federalism; World government; Interplanetary government; Interplanetary peace; Extraterrestrial liberty

1. Introduction

Baring a major catastrophe in the near future, it appears likely that in the coming centuries humanity will gradually expand outwards from Earth into the Solar System. Among many other considerations, it follows that it will become increasingly important to identify the forms of political organisation able to maximise the opportunities, and minimise the risks, that will be presented by human activities in this new environment. Key political objectives include

encouraging cultural diversity among human colonies throughout the Solar System, while at the same time minimising the risk of military conflict between them, and protecting the rights and liberties of individual colonists. With regard to the latter point, Cockell (2009; 2010) has drawn attention to the risk that extraterrestrial settlements may inexorably slide into (at least locally) totalitarian forms of government. It is very important, both for the future well-being of humans living in space and for the general peace of the Solar System as a whole, that this tendency be countered by a strong (and necessarily Solar System-wide) liberal-democratic political framework.

In this Chapter I will argue that the principle of federalism, as pioneered by the eighteenth century founders of the United States of America, provides the most viable long-term political solution to the problem of peaceably combining cultural diversity with individual liberty over large spatial scales. Liberal-democratic federal forms of government have already been demonstrated to function efficiently on continental scales (e.g. in the United States, Canada, India, and increasingly, although not yet completely, in Europe), and I will argue that the concept is inherently (and probably uniquely) expandable to planetary and inter-planetary scales. As such, federalism appears to be the most appropriate form of political organisation for a Solar System-wide civilisation.

2. The nature of federalism

In his influential discourse on political institutions, *The Spirit of the Laws*, Montesquieu (1748; p. 131) defined federalism thus:

> "This form of government is an agreement by which many political bodies consent to become citizens of the larger state that they want to form. It is a *society of societies* that make a new one, which can be enlarged by new associates that unite with it." [My italics]

As defined here, it is left ambiguous as to whether the 'citizens' of a federation are the pre-existing 'political bodies' acting in a corporate capacity, or the actual, individual, human citizens of these constituent bodies. In modern usage we would now strictly identify the former arrangement, made between essentially sovereign states, as a *confederation*. Examples include the 'Articles of Confederation and Perpetual Union' under which the 13 original American states (formerly colonies) organised themselves between 1781 and 1789, the League of Nations (1919-1946), and today's United Nations (established 1945). On the other hand, the term *federation* is now usually reserved to describe political systems where sovereignty is divided between both state and central governments, and where, following the democratic imperative identified by Locke (1689)[1], individual citizens are represented in both. The competencies of the two (or more) levels of government are usually specified in a written constitution, as a modern definition of federalism (Miller, 1987; 131) makes clear:

> "A constitutional system of government is federal if law-making powers are divided between a central legislative body and legislatures in the states or territorial units making up the federation. Citizens are thus subject for different purposes to two different bodies of law …. The allocation of powers derives

[1] E.g. *Second Treatise of Government*, Paragraph 212: "When any one, or more, shall take upon them to make laws, whom the people have not appointed so to do, they make laws without authority, which the people are not therefore bound to obey."

> from the constitution and cannot be unilaterally changed by either set of legislators."

The present constitution of the United States of America (adopted in 1789, but developed by the constitutional convention held in Philadelphia over the summer of 1787) is the archetypal federal constitution in this sense. As James Madison (1751-1836), one of the constitution's founding fathers, and later the 4th President of the United States, made clear at the time:

> "The federal and State governments are in fact but different agents and trustees of the people, constituted with different powers and designed for different purposes" (Madison, 1788a; p. 294).

As usually understood today, federalism is also closely associated with the *principle of subsidiarity*, i.e. that "a central authority should have a subsidiary function, performing only those tasks which cannot be performed effectively at a more immediate or local level" (OED, 2013). That is, the 'different purposes' of the different levels of government identified by Madison are defined such that decisions are taken at the most effective and appropriate level, with local decisions being taken locally, state-wide decisions being taken at state level, and only decisions that affect all the member states being taken by the federal government. Again, the precise division of powers will be specified in a written constitution.

Despite the evolution of the concept of federalism that has occurred since Montesquieu's day, one aspect of his original definition remains highly relevant to the present discussion – federations are inherently *expandable*. This intrinsic property of federalism is shown very clearly by the expansion of the US federal government from the original 13 states, all clinging to the eastern seaboard of North America, to include 35 new states established in the interior of the continent as the frontier of American colonisation moved westwards to the Pacific. Then in 1959 the US federation was extended to include two new states, Alaska and Hawaii, that are not contiguous with the other 48, and one of which, Hawaii, is not even part of the North American continent.

This potential for growth, and the importance of designing a constitution able to accommodate it, was recognized in the original framing of the US constitution. This was made clear by James Wilson (1742-1798), a Pennsylvanian delegate to the federal convention, and later US Supreme Court judge, speaking at Pennsylvania's ratifying convention in November 1787:

> "…the task entrusted to the federal convention, whose prospects were not only to 13 independent and sovereign states, some of which in territorial jurisdiction, population, and resource equal the most respectable nations of Europe, but likewise to innumerable states yet unformed, and to myriads of citizens who in future ages shall inhabit the vast uncultivated regions of the continent. The duties of that body therefore were not limited to local or partial considerations, but to the formation of a plan commensurate with a great and valuable portion of the globe" (Wilson, 1787; p. 138).

Although the idea would doubtless have astonished James Wilson, in the present context it is worth pointing out that his observation regarding the territorial expandability of the federal constitution can be extrapolated off the 'globe' of the Earth altogether. As far as the operation of the federal government is concerned, the state of Hawaii could just as easily be a US colony

on the Moon or Mars as a group of islands in the middle of the Pacific Ocean (we will return to the implications of this perspective in Section 5 below).

Wilson's speech to the Pennsylvania ratifying convention also highlights something else of importance when considering the development of new federal constitutions. To the framers of the US constitution the original 13 members were "independent and sovereign states" that, in order to ensure a more efficient government among themselves, voluntarily ceded part (but only a limited and carefully defined part) of their sovereignty to the newly formed federal government. Today, as the US federal government has gradually evolved into something approaching a unitary national government such as we are familiar with in Europe, it is easy to lose sight of the importance of this key political innovation. But this ability to unite proud and independent political entities into a common, and inherently expandable, political structure for the common good is a key aspect of federalism. As Wells (1922) observed in his inspirational and insightful *A Short History of the World*:

> "We call the United States a country just as we call France or Holland a country. But the two things are as different as an automobile and a one-horse shay … The United States in scale and possibility is halfway between a European state and a United States of all the world…."

As Wells foresaw, by eventually placing the resources of a continent-sized landmass under the control of a single political authority, the federal principle has enabled the United States to undertake projects that are utterly beyond the capabilities of small, European-style, nation-states. Indeed, everything that the US has achieved as a superpower (including of course its space programme) ultimately rests on the federal constitution worked out at Philadelphia in 1787. Moreover, and this is especially important in the context of this book, the federal principle has allowed the US to reach its present level of global economic and political dominance while maintaining a democratic form of government which actively protects the political freedom of its citizens. By any standards this was, and is, a remarkable political achievement. Indeed, the success of US federalism, as a solution to the problem of governing large and diverse areas while maintaining democratic governance, is further demonstrated by the 'copycat' development of other continental-sized federations. The most notable examples being those of Canada (established 1867), Australia (1901), India (1950), and most recently, but perhaps less happily from a democratic standpoint, Russia (1993).

Perhaps the biggest missed opportunity in the history of federalism to-date was the failure of the Spanish and Portuguese colonies in South America to federate along the lines of the US model, despite apparently having much in common as regards colonial history, language, and religion (the latter, at least, being more homogeneous in South than in North America during colonial times). It seems clear that South America would be better off today, and would have had a happier history regarding the rights and freedoms of those who live there, had a democratic South American federation been achieved. Probably the failure of South America to federate can be put down to the fact that the constituent states were already too large, and too geographically dispersed over the continent, for unified political action to be possible at the time of decolonisation. Still, the South American example contains several important lessons. Firstly it acts as a mirror to show what North America might look like today had the US federal constitution not been ratified in 1789 (with enormous, and as far I can see entirely negative, implications for subsequent world history); secondly, it shows that, despite clear economic and political benefits, there is nothing inevitable about federalism, even in areas sharing a similar culture and historical experience – federations have instead to be actively

created through the application of political will; and, thirdly, timing is crucial – if the requisite political will is not applied at the beginning, before the constituent states evolve too far down their individual paths towards political independence, achieving federation will become increasingly difficult regardless of manifest political and economic advantages. This last consideration is likely to be especially important in the context of interplanetary federalism, as discussed in Section 5 below.

Before leaving this historical discussion of federalism, and moving on to future possibilities, it is necessary to consider the significance of federal innovations currently taking place in Western Europe. Over the centuries, the presence of so many independent nation-states existing within so small an area has cause nothing but trouble for Europe, and it has long been recognized that the continent would benefit from some kind of unified government (Heater, 1992). Following the Second World War, through the vision of Jean Monnet (1888-1979), Robert Schuman (1886-1963), Konrad Adenauer (1876-1967), Paul-Henri Spaak (1899-1972), Altiero Spinelli (1907-1986) and many others, and through the gradual evolution of pan-European institutions from the European Coal and Steel Community (1952), the European Economic Community (1958) and the European Union (1993), Europe has been gradually inching towards a federal solution to problems caused by its historical disunity.

The European Union is of course not (yet) a federal United States of Europe on the US model, having more a confederal than a federal structure with national governments mostly represented in their corporate capacities. Nevertheless, the existence of a written constitution (currently the Lisbon Treaty which entered into force in 2009) specifying the division of powers between the decision-making institutions of the Union and the member states, the explicit recognition of the principle of subsidiarity (in Article 3(b) of the Treaty[2]), a single currency (albeit one that several member states have so far chosen not to join) and, especially, the establishment of a directly elected European Parliament, have all introduced some genuinely federal aspects into its organisation.

This is important because, while the US experience demonstrated that federalism can unite large geographical areas given a relatively homogeneous starting population, Europe has the potential to demonstrate that a federal form of government can also unite many different nations, speaking many different languages, and having a long history of conflict. Indeed, if federalism can be shown to work in Europe, where the modern nation-state was invented (in the aftermath of the collapse of the Roman Empire), there is every reason to believe that it can work anywhere.

3 Federalism as a protector of peace, diversity and liberty

The greater the number independent sovereign states occupying a given area (be it a continent, a planet, or even, in the context of this book, a planetary system), with each state pursuing its own perceived self-interest and acting as judge in its own cause, the greater will be the likelihood of conflict occurring between them. Preventing future military conflict between the recently independent American states was therefore a key consideration in the framing of US federal constitution, as Hamilton (1788a; p. 54) makes clear in *The Federalist Papers*:

[2] Treaty of Lisbon (2009), Article 3(b), Paragraph 3: "Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and insofar as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at central level or at regional and local level, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level." http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2007:306:0010:0041:EN:PDF

> "A man must be far gone in Utopian speculations who can seriously doubt that if these States should either be disunited, or only united in partial confederacies, the subdivisions into which they might be thrown would have frequent and violent contests with each other. … To look for a continuation of harmony between a number of independent, unconnected sovereignties situated in the same neighbourhood would be to disregard the uniform course of human events, and to set at defiance the accumulated experience of ages."

Federal forms of government therefore promote peace by integrating previously independent sovereignties into a single political framework within which political differences can be addressed by legal and constitutional means rather than through military conflict. The contrast between the internal histories of the federated United States of America (and also Canada) with the un-federated nations of South America is again instructive in this regard. In the post-colonial period the latter have been racked by more than twenty-five inter-state and civil wars (Wikipedia, 2013), while the United States has suffered only one (albeit almost catastrophic) civil war over an issue that was left unresolved by the constitution. And the bloody history of the continent of Europe speaks for itself, and is a major reason why moves towards European political integration are so important.

The principal topic of this book, however, concerns liberty rather than peace *per se*, and here again one of the principal benefits of federalism becomes apparent: it is the only known political system which is able to accommodate both cultural diversity and individual political liberty under a single government. As we have seen, federal forms of government are able to accommodate diversity by integrating pre-existing political units (e.g. colonies, states, nations), each possibly having a distinctive culture, into a political union operating according to the principle of subsidiarity. They are able to protect liberty by ensuring that individual citizens are directly represented in *both* the federal and the state (and often also local) governments. Moreover, federal governments generally operate according to a written constitution which explicitly guarantees individual political freedoms, and which also instigates checks and balances between the different levels and organs of government so as to minimise the risk of usurpation by illiberal and non-democratic forces (Mayerfeld, 2011).

Again the US federal constitution provides an example, because preserving the liberty of individual citizens was a major preoccupation of the drafters of that document. Initially it was felt that, as each member state already had a 'republican' form of government (which was as democratic as things got in the eighteenth century), all that was necessary was for the federal constitution to ensure continued republican government in the states. Thus, Article IV, Section 4, of the US Constitution states that:

> "The United States shall guarantee to every State in this Union a republican form of Government, and shall protect each of them against invasion; and …. against domestic [i.e. intra-state] violence."

Shortly thereafter, however, it was realised that this formulation may not have gone far enough to protect the rights of individual citizens, and in 1791 the first ten amendments (the so-called 'Bill of Rights') were ratified, of which the first famously states:

> "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of

the press; or the right of the people peaceably to assemble, or to petition the Government for a redress of grievances."

In Europe similar liberties are protected by the European Convention on Human Rights, which was established by the Council of Europe in 1950 and entered into force in 1953. While not originally a component of European political integration (having been signed by many more European nation-states than are currently members of the EU), the European Convention on Human Rights nevertheless become a key guarantor of individual rights within the European Union following ratification of the Lisbon Treaty in 2009[3].

Thus, by providing legal underpinning for the protection of basic freedoms, federal systems of government make enforcement of such freedoms easier than would be possible through treaties between independent states, which ultimately are not enforceable without military conflict. This is not to say that such constitutional rights are always upheld even within well-functioning constitutional democracies[4], only that civil rights are better protected by the existence of such constitutional protections than they would be without them.

4. World federalism

Given the inherently expandable nature of federalism, and the demonstrable practical and political benefits it has conferred on continental scales, and before moving on to consider even larger extraterrestrial scales, it is worth pausing to consider if the federal principle might be extended to include the Earth as a whole. Would a federal *world government* be possible or desirable?

There are in fact many compelling reasons for believing that some form of world government is indeed desirable, and the idea has long been discussed by historians, statesmen and political philosophers (e.g. Kant, 1795; Russell 1916; Wells, 1922; Reves, 1946; Laski, 1967; Toynbee, 1972; Kerr, 1990; Converse, 2010; Cabrera, 2011; a scholarly historical discussion is given by Heater, 1996). The desirability of world government stems primarily from the fact that Planet Earth has many problems that can only be effectively addressed at a global level. Examples include: (i) an essentially anarchic international environment where heavily armed nation-states act as judges in their own cause (making military confrontation and the attendant waste of lives and resources all but inevitable); (ii) global environmental pollution (including man-made contributions to climate change); (iii) global habitat destruction and loss of biodiversity; (iv) large-scale global threats (such as the risks of global pandemics, mega-volcanoes and

[3] Treaty of Lisbon (2009), Article 6, Paragraph 2: "The Union shall accede to the European Convention for the Protection of Human Rights and Fundamental Freedoms." And Paragraph 3: "Fundamental rights, as guaranteed by the European Convention for the Protection of Human Rights and Fundamental Freedoms and as they result from the constitutional traditions common to the Member States, shall constitute general principles of the Union's law."

[4] Recent revelations that the US National Security Agency has been indiscriminately harvesting telephone and internet records of millions of US citizens imply that constitutional protections of privacy, or at least the *spirit* of those protections, are currently being ignored by the executive branch of the federal government. The 4th Amendment clearly states that: "The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized." Hopefully, the checks and balances built into the US federal system will ensure that the protections guaranteed by the 4th Amendment are soon restored, as this will demonstrate the proper functioning of the federal constitution as envisaged by its founders. The alternative would presage a slide into totalitarianism by the world's oldest constitutional democracy, and does not bear thinking about.

asteroid impacts); (v) long-term development challenges (including the provision of sufficient food and water, and the satisfaction of legitimate aspirations for higher living standards, for a growing world population; and (vi) inefficient, and often irresponsible, management of the global commons, including the resources of the seas (both fisheries and seabed resources), the Antarctic continent, and, especially relevant to the topic of this book, outer space.

Attempted solutions to these problems based on voluntary agreements between independent nation-states have proved to be largely ineffective, for the simple reason that the perceived self-interests of these independent sovereignties are in conflict. Therefore, as Heater (1996; p. 205) succinctly puts it:

> "Individual states are at best powerless to prevent wars and environmental degradation, at worst they are the cause of these disasters. Only effective world government can protect mankind from these hazards."

But if the world needs a government it remains necessary to determine the *form* of government that would be best matched to its needs. While there is a powerful case for a global government that can deal with global problems at a global level, it would be unnecessary (and indeed unwise) to disrupt existing, and generally well-functioning, government at national and local levels. Moreover, given the extent to which the (I would argue pernicious) ethos of nationalism dominates global politics, it would be quite impractical (and in fact counter-productive) to dissolve existing national governments in favour of a world government. Therefore, the best we could realistically hope for would be the establishment a *federal* world government, built from the agreement of the existing nation-states, and operating in accordance with the principle of subsidiarity extended to the global stage. This is the essence of the concept of *world federalism*, which seeks to:

> "invest legal and political authority in world institutions to deal with problems which can only be treated at the global level, while affirming the sovereignty of the nation-state in matters which are essentially internal." (WFM, 2005).

It is notable that Madison (1788b; p. 277), reflecting on the wider implications of the US constitution, came close to advocating just such a federal solution to the world's political disunity when, writing in *The Federalist Papers*, he expressed the opinion that:

> "Happy would it be if such a remedy …. could be enjoyed by all free governments; if a project equally effectual could be established for the universal peace of mankind!"

And, just a few years later, Immanuel Kant (1795; p. 117) made the case more explicitly:

> "Reason can provide related nations with no other means for emerging from the state of lawlessness, which consists solely in war, than that they give up their savage (lawless) freedom …. and, by accommodating themselves to the constraints of common law, establish a *nation of peoples* (*civitas gentium*) that (continually growing) will finally include all the people of the earth." [Kant's italics]

The technical practicality of such a world federation is not in doubt – given modern communications and transport capabilities Planet Earth is, in any meaningful practical sense,

already far smaller than the area united by the US constitution in 1789. Whether or not such a global federation is *politically* possible in the near future is of course more doubtful. As noted above, much depends on the outcome of the European experiment – if federalism can be shown to work in Europe, with its multitude of nations, languages, and history of internecine conflict, then there is hope that it might be extended to global scales. On the other hand, if the European experiment fails there would be grounds for pessimism concerning our ability to develop international government on any significant scale. This in turn would leave the human race without the political tools to deal effectively with the serious global challenges that we will face in the future.

Daunting though the political obstacles to world federalism undoubtedly are, there may nevertheless be grounds for optimism in the context of a future which includes a significant element of space exploration and development. There are several reasons for this, but perhaps the most important is simply the psychological impact of a growing 'cosmicization' of world views. A society that is rigorously exploring the Solar System, and building colonies on the Moon, Mars, and asteroids (which is the societal backdrop on which the topic of this book is predicated), can hardly fail to be aware that the 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 (Schweickart, 1977):

> "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 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, and those whom they represent, and lead to the (in part purely emotional) realisation that in some sense Planet Earth *ought* to be politically unified.

Moreover, there are also very real practical considerations. For one thing, space development will require the establishment of legal and political mechanisms for the management of extraterrestrial raw materials and, as we have seen above, these naturally fall into the category of global 'commons' that are beyond the competence of individual national governments to manage. Even more seriously, any significant programme of space exploration and colonisation will inevitably require the use of energy sources (e.g. nuclear power and propulsion), and very likely the ability to manipulate the orbits of asteroids, that will be potentially dangerous to Earth's inhabitants. It seems most unlikely that these technologies could safely be deployed in space in the absence of a global legal and political regime capable of ensuring that they are not misused, and in particular that they cannot become military tools for one or more nation-states to threaten others. A world government able to effectively regulate the use of potentially dangerous space technologies would maximise humanity's safety in this respect. Last but not least, it is possible that only a politically united world, one that no longer has to spend a significant fraction of its wealth arming itself against itself, would be able to afford a large scale programme of space exploration and development in the first place.

For these reasons, I have suggested elsewhere (Crawford, 1993; 1995a) that a symbiotic (strictly mutualistic) relationship may ultimately develop between space development and world government. On the one hand, a world government may need space development to provide the cosmic perspective on which part of its psychological legitimacy may rest, and also the space resources on which the world economy may increasingly come to depend (e.g. Martin, 1985; Lewis et al., 1993), while on the other hand space exploration may need the funding and security that only a world government could provide. In this context it is also worth reflecting on the 'Golden Rule of Space Exploration' advocated by Hartmann et al. (1984; p.182), viz:

> "Space Exploration must be carried out in a way so as to reduce, not aggravate, tensions in human society. Each decision, each policy, must be tested against this principle."

If the development of the Solar System can indeed be carried out in this enlightened manner, aided by appropriate legal and political institutions, then it cannot but help the wider cause of human integration. As we have seen, there are multiple reasons why Planet Earth would benefit from an (ideally federal) world government quite unrelated to space exploration, but the socio-political implications of space development, and especially an increasing global awareness of the cosmic perspective, may in the future help tip the balance of the arguments in its favour.

5. Interplanetary Federalism

The initial phases of human colonisation of the Solar System will probably consist of establishing small scientific research stations on the Moon and Mars, commercially-driven activities around near-Earth and Main-Belt asteroids, and facilities in space (and possibly also on the surfaces of Moon and Mars) designed to cater for space tourism. Even in these early stages it will be necessary to develop a legal framework governing the activities of these outposts, and protecting the well-being of people living and working in them. We have argued above that dealing with extraterrestrial affairs on behalf of humanity as a whole would be a logical task for a future federal world government. However, even in the most optimistic view, it appears unlikely that a world government will exist during the earliest phases of Solar System colonisation (i.e. over the next several decades), so the near-future regulatory regime will presumably have to be based on international treaties[5].

[5] Currently international activities in space are governed by the United Nations Outer Space Treaty (strictly the 'Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies'), which entered into force in October 1967. Currently this treaty has 102 states parties, including all major space powers. Although it has served the international community well for much of the space age to-date, it is inadequate for dealing with issues that will soon be upon us. These include the exploitation of extraterrestrial raw materials; the regulation of space tourism; and, in the context of this book, the rights and liberties of the inhabitants of space colonies (which needless-to-say were not considered at the time the Treaty was formulated). Attempts to extend the reach of the 1967 Treaty (e.g. the 'Treaty Governing the Activities of States on the Moon and Other Celestial Bodies' of 1979, the so-called Moon Treaty) have not been very successful (the Moon Treaty has not been ratified by *any* major space power). It is therefore clear that there is a large area of international space law that will need to be developed if space activities in the first part of the 21st century are to be properly regulated (see, e.g., the thoughtful discussion by Goldman, 1985). That such activities will need to be regulated can hardly be doubted, given the risk that some of them (e.g. changing the orbits of asteroids to better facilitate resource extraction) may pose a serious risk to Earth's inhabitants, and the more mundane consideration that private companies are unlikely to invest in space (either for resource exploitation or tourism) unless their investments are protected by an appropriate legal framework.

Over time these small outposts are likely to grow into self-supporting colonies and the question of their governance will become increasingly important. It is however important to realise that the likely timescale for the evolution of extraterrestrial outposts into self-sufficient colonies (probably a century or more) is of the same order of magnitude as that which we may expect for the gradual evolution of Earth's own political integration along federal lines. Indeed, one can foresee a situation in which the two strands of political evolution, terrestrial and extraterrestrial, proceed in parallel, and where, as noted above (see also Crawford, 1993; 1995a), they co-evolve in a mutualistic manner towards a federal form of organisation able to encompass both Earth *and* her colonies. An intermediate stage in such a co-evolution between space activities and global governance might include the United Nations taking on more responsibility for space activities, while at the same time implementing a more federal form of international decision making (for example by the addition to, or replacement of, the existing UN General Assembly by a directly elected parliamentary assembly; e.g. Crawford, 1994; UNPA, 2013). One way in which a strengthened UN could play a significant role in space activities would be through the formation of a World Space Agency to coordinate space development on behalf of humanity as a whole (e.g., Crawford, 1981; Katz, 1985). Already, space exploration is becomingly increasingly internationalized (see the extensive recent review by Ehrenfreund et al., 2012), and the recently formulated Global Exploration Strategy (GES, 2007) and Global Exploration Roadmap (ISECG, 2013) could perhaps form the basis of a genuinely global world space programme.

We have already noted that the principle of federalism is expandable to large spatial scales. It could certainly encompass the whole Solar System, across which the communication timescale is at most a few hours, and where (depending on the transportation technology available in the future) the physical transit times might be only weeks or months – still effectively no larger, and in some senses smaller, than was the continent of North America in 1789. We have already noted that, as far as the functioning of the US federal government is concerned, the state of Hawaii could just as easily be a colony on another planet as a group of islands in the Pacific Ocean. Thus the technical feasibility of a Solar System-wide federal government, just as for a planet-wide federal government on Earth, can hardly be doubted. Moreover, a plausible evolutionary route towards such an outcome can be identified in a political context within which Earth itself evolves towards a federal form of organisation over the same timescale.

The *desirability* of a federal Solar System is of course a separate matter, and in my view rests on a straightforward extrapolation of the arguments for a federal Earth. Specifically, that only a federal solution will simultaneously satisfy the three criteria of (i) accommodating and protecting social and cultural diversity; (ii) minimising the risk of conflict between these diverse elements; and (iii) maximising the chances of individual and political liberty within the individual colonies. There are many potential forms of political organisation, ranging from anarchy to dictatorship, that could accomplish one or other of these objectives, but it seems to me that only a federal form of organisation could achieve all three at the same time, as we now discuss.

5.1 Accommodating interplanetary diversity

One of the potential societal benefits resulting from an expansion of humanity into space will be increased opportunities for the diversification of human culture, what John Stuart Mill (1859; p.120) termed "different experiments of living", that may not occur on an increasingly culturally homogeneous Earth. Indeed, this was recognized by the philosopher Olaf Stapledon

(1948) a decade before the space age had even begun, when, in a lecture to the British Interplanetary Society, he argued that:

> "The goal for the solar system would seem to be that it should become an interplanetary community of very diverse worlds each inhabited by its appropriate race of intelligent beings, its characteristic "humanity"….. Through the pooling of this wealth of experience, through this 'commonwealth of worlds' new levels of mental and spiritual development should become possible, levels at present quite inconceivable to man."

Not unrelated, and certainly an additional cultural benefit of space exploration and colonisation, will be the increased opportunities for scientific discovery and intellectual stimuli of multiple kinds compared to what we could hope to experience by remaining on our home planet. This may go some way towards preventing the kind of intellectual stagnation predicted for 'the end of history' by the American political philosopher Francis Fukuyama (1992; see also Crawford, 1993).

One might initially be tempted to argue that if maximising diversity is the principal social benefit to be expected from space colonisation then one should not seek to impose external political constraints of any kind on extraterrestrial colonies. However, a moment's thought will reveal that such interplanetary anarchy is not desirable; without some unifying political framework the disparate Solar System colonies could easily come to resemble Hamilton's (1788b; p.73) nightmare vision of the thirteen American colonies in the absence of the federal constitution, i.e. split

> "into an infinity of little, jealous, clashing, tumultuous commonwealths, the wretched nurseries of unceasing discord and the miserable objects of universal pity and contempt."

Such an environment is unlikely to provide the kind of environment within which human intellectual and cultural potential would be maximised. Moreover, leaving aside the fact that numerous independent 'jealous, clashing, tumultuous' colonies would significantly increase the risk of interplanetary conflict (the implications of which are discussed separately below), if humanity as a whole is to benefit from the fruits of interplanetary diversity then some form of interplanetary organisation will be required to integrate all these different experiences. This led Stapledon (1948) to propose his concept of a 'commonwealth of worlds'. Stapledon did not explicitly address the political organisation of this 'commonwealth', but a federal arrangement that applies the principle of subsidiarity on interplanetary scales, and thereby explicitly protects colonial diversity, would appear to be the most appropriate arrangement (see also Crawford, 2012).

5.2 Preventing interplanetary war

Although interplanetary cultural diversity is desirable, interplanetary anarchy and conflict are not. As discussed by Baxter and Crawford elsewhere in this volume, the energies available to a spacefaring civilisation (even considering only the kinetic energies of space vehicles and of small asteroids whose orbits may be manipulated) are such that, if used aggressively, the continued habitability of the Earth, and the very survival of its colonies, would be at stake. It

therefore follows that interplanetary cultural diversity will need to be managed within some kind of appropriate political structure that minimises the risk of conflict.

Again, there are a number of potential political arrangements that might achieve this objective, of which the most secure might be a totalitarian control of space activities by Earth-bound institutions (e.g. by a future world government). However, a totalitarian, essentially imperial, model is not a desirable solution to the problem of interplanetary peace, for at least three reasons: (i) such a model is unlikely to permit the kind of colonial cultural diversity that we have already identified as desirable; (ii) it will by definition limit the extent of personal and political freedoms enjoyed by the individual colonists, which is something we wish to promote; and (iii) for this very reason it is likely to promote a colonial backlash against the central government and thereby increase the risk of conflict.

We have already seen (Section 3 above) that minimising the possibility of war is one of the key benefits of federal forms of government. This is achieved because federations both reduce the number of independent sovereign states, and thereby the opportunities for conflict between them, *and* provide legal and constitutional mechanisms to resolve differences without the perceived need to resort to violence. This will be as true on interplanetary scales as it is on planetary and sub-planetary scales. However, there is an important lesson from Earth history: if the risk of wars of independence is to be avoided it will be important to establish a framework for interplanetary federation *before* the colonies become self-sufficient and begin to see themselves as potentially independent political entities. Had Great Britain managed to create a (necessarily federal) political union with its American colonies prior to 1776 (such that there *was* representation regarding colonial taxation, for example) then the US Revolutionary War might have been avoided. Similarly, had South America managed to adopt a federal form of government on the US model before its newly independent nation-states diverged too far for this to be practical, then its post-colonial history would probably have been happier and its economy far stronger. Therefore timing is important, and the groundwork for interplanetary federalism will need to be developed in parallel with the earliest phases of Solar System colonisation.

Just to reinforce this latter point, it is instructive to imagine what the Solar System may be like if we fail to develop appropriate unifying political institutions at an early stage. The science fiction author Kim Stanley Robinson has envisaged just such a Solar System-wide society of the 24th Century and reflects on the (fictional) historical observation that:

> "One mistake was that no generally agreed-upon system of governance in space was ever established. That repeated the situation on Earth, where no world government ever emerged. Balkanization became universal; and one aspect of balkanization was a reversion to tribalism, notorious for defining those not in the tribe as not human, sometimes with terrible results. It was not a good structure of feeling for a civilisation spanning the Solar System and wielding ever-greater [power]" (Robinson, 2012; p. 337).

5.3 Maximising interplanetary liberty

We turn now to the main theme of this book. Historically, discussions regarding the colonisation of other planets have tended to assume that the process would enhance human liberty by allowing minority or persecuted groups on Earth to escape and build new lives

elsewhere in the Solar System. The non-conformist colony established by the Pilgrim Fathers in 1620 at present-day Plymouth, Massachusetts, is an oft-cited example. Indeed, building on this example, and referring to the work of O'Neill (1976) on self-supporting space colonies, Dyson (1979; p. 126) articulates this vision thus:

> "O'Neill and I have a dream, that one day there will be a free expansion of small groups of private citizens all over the solar system and beyond."

At first sight this appears to be a noble dream, until we recall Hamilton's (1788b) warning, quoted above, about the dangers of colonial anarchy. Indeed, in this context, it is appropriate to reflect on the fact that today the good citizens of Plymouth, Massachusetts, are infinitely better off securely embedded within the federal constitution that was devised 150 years after their colony was founded than they would be had the state of Massachusetts chosen to remain outside it.

Moreover, as Cockell (2009; 2010) has pointed out, the dream of colonial 'freedom' could easily turn into a nightmare if the socio-political arrangements are not handled with care. This is because, at least for the foreseeable future, the physical environment of space colonies (small, cramped, and entirely dependent on life support equipment) will naturally lend itself to totalitarian forms of governance. Not only will the ability to switch life support machinery on and off at will give the governors of these colonies (whether individuals or groups) immediate power over life and death, but the vulnerability of the survival of such colonies to potentially harmful unauthorised activities of multiple kinds will in certain respects *demand* authoritarian forms of governance.

The prospect for personal liberty in isolated space colonies therefore appears rather bleak. Even if established on liberal democratic principles, if left on their own devices colonies could easily slip into totalitarianism. However, as Converse (2010), in his study of the lessons of the US constitution for world federalism, has rightly pointed out:

> "the liberty of any given society of people depends, to a great degree, upon the institutions that exist, or they create, to protect it."

Getting the legal and political institutions right is therefore essential. The simplest institutional way to minimise the risk of a slide into totalitarianism would be to ensure that all such colonies are, *from the start*, embedded in a larger political framework that guarantees individual rights and liberties in a manner that the local governors of these colonies would find hard to overturn. As we have seen above (Section 3), this is something that federal forms of government are naturally able to do for their constituent states, and it was a key consideration in the framing of the US constitution (and the subsequent ratification of the Bill of Rights[6]). By way of analogy, consider that, even though geographically isolated from the other states of the Union, it would today be politically impossible for the state of Hawaii to implement policies that violate to the First Amendment. There is no reason why a suitably constituted interplanetary federation could not guarantee similar rights for its members.

[6] Especially Amendments I and IV through X; clearly, Amendment II would not be helpful in an interplanetary context, and Amendment III seems hardly relevant. Of course, any actual interplanetary Bill of Rights would have to be constructed so as to be relevant to the particular social and physical conditions within which individual rights are to be protected.

Cockell (2010) has given a lot of thought to minimising the risk of extraterrestrial tyranny, and has come to essentially the same solution. Thus he writes:

> "Eventually the link between the Earth and other settlements, as well as the relationship between those settlements, might be governed by some kind of League of Worlds …. Such an organisation would promulgate the general philosophy of liberty-seeking, *whilst still allowing each planetary body or place in space to work on the emergence of its own brand of liberty, under its own specific set of challenges.* By nurturing links between all settlements and the Earth, it would serve many political and economic purposes….." (Cockell, 2010; my italics).

This is of course an essentially a federal solution, where the phrase I have italicised above implies the operation of the principle of subsidiarity on interplanetary scales. If properly constituted, in addition to helping to maximise extraterrestrial liberty such a 'League of Worlds' could indeed 'serve many political and economic purposes', not least minimising the risk of interplanetary war (Section 5.2) and maximising the cultural benefits of interplanetary diversity (Section 5.1; in which context it would fulfil the role already envisaged by Stapledon's 'Commonwealth of Worlds').

However, in order to maximise all these socio-political benefits, it is important that the phrase 'League of Worlds' be interpreted as a true federal government (in the sense described in Section 2 above). What the Solar System does not need, and what all experience tells us would ultimately prove to be disastrous, is a weak *confederal* structure along the lines of the ill-fated League of Nations. History has taught us that these are not effective (other failed examples include the US Articles of Confederation (1781-89) and, it has to be said, the United Nations since 1945). Only a democratic federal government, with constitutional provision for appropriate implementation of the principle of subsidiarity, is likely to be sufficiently robust to be both long-lasting and effective.

6. Conclusions

As Aristotle (350 BCE) pointed out long ago "man is by nature a political animal", and we regulate our affairs through our political institutions. It follows that, as humanity moves out into the Solar System, we will have to design and implement political institutions appropriate to our operations and well-being in this new environment. Foremost among these institutions will be forms of government able to simultaneously maximise the opportunities for peace, diversity and liberty within the extraterrestrial realm. I have argued here that only a democratic federal form of government, constitutionally applying the principle of subsidiarity on interplanetary scales, will be able to simultaneously satisfy all three of these requirements. I have further suggested that such an interplanetary federation may grow out of, and perhaps co-evolve with, a federal world government on Earth for which strong arguments can also be identified.

It is important to realise that federalism is not a panacea for human happiness, either on Earth or beyond. Forms of government can only go so far in that respect, and much will in any case depend on the particular constitutional arrangements adopted. Moreover, there can be no guarantee that even well constituted federations will never fail. All I would argue is that, when

compared with other political arrangements that might be applied to humanity's operations beyond Earth, an appropriately constituted federal government, which incorporates both Earth and her colonies, will maximise the opportunities for interplanetary diversity while minimising the risk of conflict and tyranny. But, in the nature of things, there can be no guarantees. As Madison pointed out in *The Federalist Papers*:

> "It is a sufficient recommendation of the federal Constitution that it *diminishes the risk* of [calamities] for which no possible constitution can provide a cure…." (Madison, 1788b; p. 277; my italics).

Finally, it is worth pointing out that a human civilisation occupying a large part of the Solar System, and politically united by a single (federal) form of government, will have enormous intellectual, physical, and technological resources at its disposal. It is in this societal and political context that plans for interstellar exploration and colonisation are likely to become feasible. The scientific and cultural benefits of interstellar exploration are potentially enormous (see discussion by Crawford, 2013, and references therein), but it will pose fundamental problems for legal and political institutions. Indeed, although appropriate and desirable on interplanetary scales, the time delays imposed by the finite speed of light imply that federal forms of government (or any other form of government) are less likely to work (and may in fact be impossible[7]) on interstellar scales.

It follows that the kind of unrestrained colonial 'freedom' (or 'anarchy' depending on one's point of view), advocated by Dyson (1979) and by many others, may yet come to pass in the context of *interstellar* colonisation. However, the basic political problems of avoiding conflict between independent sovereign entities, while at the same time maximising the opportunities for diversity and liberty, will still remain. Therefore, even if interstellar federations prove to be impractical, it seems that a future interstellar humanity (or post-humanity) may nevertheless opt for the establishment of local, planetary system-scale, federations in each colonised star system. It would be interesting to know what the eighteenth century pioneers of federalism would have made of that prospect!

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[7] As discussed by Crawford (1995b), if faster-than-light travel or communication proves to be possible then it *would* be possible to establish interstellar political institutions, including interstellar federations. However there are at present no reasons to believe that faster-than-light travel could ever be technologically feasible, even if, given certain assumptions, it appears that it may be theoretically possible within the framework of General Relativity.

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