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Abstract

This chapter attempts to find a distinctive role for Indigenous peoples within a democratically geared human expansion into space. The core case is set out via an 'argument from belonging' in which Indigenous knowledge about belonging can promote the sustainability of projects in space, given that the latter are multi-generational projects and therefore vulnerable to cultural change over time. Knowledge about what runs deep in our human concern with space can help us to deal with this vulnerability, and with the danger that our projects may be discarded by future generations who are unlikely to share all of our aspirations and concerns.

Keywords

democratization, Indigenous peoples, sustainability, space, belonging

Indigenous inclusion within the democratization of space

Tony Milligan

When the Perseverance Rover landed on Mars in 2021, the first prominent feature that it examined was then named 'Máas', a Navajo/Diné borrow word from English (NPR 2021). One of an initial list of 50 names put together with the help of Jonathan Nez, then president of the Navajo Nation, with a view towards use by NASA. The latest development in a Navajo–NASA relationship that goes back to the very beginnings of the US space programme, with some predictable ups and downs in the early days. In more recent times it has helped to create pathways for the use of satellite data to monitor water supplies on Navajo lands, and for individual Navajo to make their way into NASA posts. At the time of the landing, Aaron Yazzie was called upon regularly by the media, as an engineer on the Perseverance team based out of the NASA Jet Propulsion Laboratory. Yazzie is Navajo/Diné. The Navajo/Diné relationship is also something of a model for a broader series of

cooperations and moves to include Indigenous groups within the space programme. Although admirable, there remains a good deal of distance between cooperations of this sort and the idea of a distinctive Indigenous role in our current processes of space expansion, or within processes that we might refer to as ‘the democratization of space’. What I will be trying to identify in this chapter is a role of this more distinctive sort, a role that (in some sense) only Indigenous agents can play.

The approach will be broadly philosophical and analytic, in the sense that it will be heavily weighted towards concepts and argument building rather than anything like ethnographic studies or anthropological overviews of Indigenous peoples. Section 1 will provide some overall framing by situating the question of a distinctively Indigenous role within the broader idea of ‘democratizing space’. This is not just a preliminary, the chapter has an arc that returns, towards the end, to democratic commitment as an important constraint. Section 2 will outline my core argument, the ‘argument from belonging’, and will clarify the scope of what is claimed. My argument is not that all indigenous peoples can or should have a distinctive contribution but merely that space expansion would benefit in a distinctive way from distinctive Indigenous input. A way that goes beyond the gain in legitimacy for space programmes that generally results from greater inclusion. This distinctive input will turn upon Indigenous knowledge about belonging. Section 3 will introduce a further ‘liberties argument’ as a foil to help clarify the argument from belonging. Section 4 will appeal to an understanding of science thatis constrained by commitment to democracy in order to form a clearer conception of the kind of knowledge about belonging that is at stake, and an understanding of the science/Indigenous knowledge distinction that reduces (but may not entirely remove) worries about inclusion as appropriation.

1. Democratizing Space

The idea of ‘democratizing space’ is one of the recurring concepts appealed to in contemporary public discussions of human space expansion (Baiocchi and Welser (2015); Welser 2016; Kim 2019). To help broaden it out beyond a largely commercial conception, I want to situate two minimal commitments at the heart of the idea. The first is commitment to the permissibility of human expansion into some broader region of space. The second is a commitment to the democratization of space in a sense that relates to our regular understanding of democracy as inclusive and value based rather than merely procedural. These are minimal commitments in various respects. They concern activities only in ‘some broader region of space’ rather than grandiose plans. Indeed, this region of space could be cislunar and need not reach out any further than the orbit of the Moon. Alternatively, it could extend as far as Mars and beyond, out towards the main asteroid belt. The commitments are also minimal in the sense that they are constrained in terms of content as well as location. Saying that expansion into space is ‘permissible’ does not actually require anyone to go there. (For convenience, I refer to space as ‘there’ as if we were not ourselves already part of it.) An appeal to the permissibility of going is just a way of saying that there is no fundamental ethical barrier in the way of our doing so. We might do bad things in space, or good things in space. We will probably do both. But going is not itself a bad thing.

By embracing ‘democratization’, we are also committing to much less than might be imagined. It may involve as little as the following: as far as reasonable, actual expansion into space should be in line with inclusion and the political liberties that we associate with a modern democracy whatever form it may take. Note, I have connected democracy strongly to values rather than adopting a procedural conception. Values of this sort are more basic to democracy than any particular type of electoral system. In a sense, the electoral systems that we adopt are themselves expressions of values such as liberty and equality (community too), which is one of the reasons why we ordinarily regard its flaws and occasional paradoxes as something

secondary. After all, government within a modern democracy rarely depends upon securing the votes of an actual majority of the population. US presidents sometimes come close, UK governments never do. Yet both enjoy democratic legitimacy. Democracy is about something more than procedure. And so, an inability to shift all our familiar procedures from here out into space does not mean that we cannot democratize space in a sense that focuses upon values as much as mechanisms.

Building a utopia in space is, however, unlikely. Nonetheless, if we are committed to democratization, and if we take our earthly democracies as a benchmark, then we should try to do at least as well there, and perhaps better in obvious respects. A useful analogy may be made with moving to a new town. Sometimes we need to move to a new place in order to become a better version of ourselves. Something similar may apply to humans collectively as we reach up into space. There are entrenched failings down here. And a kind of sociopolitical inertia that makes widely desired changes difficult to bring about in the absence of war, state collapse, and processes of reconstruction. We simply do not need to reproduce all such failings up there, especially when they can pose problems for the sustainability of what we are trying to bring about. Here, we may reflect upon the Apollo Program and its more or less abrupt end. In retrospect, basing space expansion on white men from the military was hardly a recipe for sustained and diverse public support in the face of demographic change, social unrest, and economic difficulties. There are some failings, such as gender bias and racism, both personal and institutional, that we would do well to leave behind. Partly, this is because it is the right thing to do. But it is also sometimes the most practical and sustainable thing to do; not always, but sometimes and perhaps often. Ethical commitment to robust forms of inclusion can enable space programmes which might otherwise be compromised by failings of these familiar sorts.

Perhaps, even if successes over such matters are counterbalanced by other failings, we might find that overall we are no better in our treatment of one another in space, but we should

minimally try not to be worse. (Again, in some overall sense.) A qualification to this picture is that there are significant physical obstacles in the way of any attempt to reproduce political liberties in space (Cockell 2022). Freedom in space would be what Charles Cockell has called 'freedom in a box' (Cockell 2015) Yet, the sheer physical obstacles facing life in an extreme environment are very different from the more easily variable socially generated barriers that we might take with us as legacies of prejudice and exclusion. Recognition of such dangerous legacies will also help us to understand just what it is that we are trying to secure when we talk about 'democratization' if the latter is to be understood in a sufficiently pragmatic sense as something attainable. There are liberties and entitlements that many of us enjoy, from which many other humans are unfairly excluded for reasons of colour, ethnicity, gender, nationality, wealth, and religion. Reflection upon these liberties, entitlements, and unfair exclusions can help to shape our grasp of just what it is that we ought to be doing in space and anywhere else if we are genuinely committed to democratization.

All of this does, of course, involve an understanding of 'democratizing space' that is constrained but still significantly broader than the way that the concept is sometimes used in discussions which centre upon commercialization (Cobb 2021). Within the latter, democratization is thought of in terms that lean upon an idea of the democracy of the market, the avoidance of commercial monopoly, and of excessive or exclusive state control. These things may be integral to our best available systems of democracy, but democratization in the sense that concerns me here will be broader and extend to the valuing of liberties and entitlements of other sorts. Liberties such as certain kinds of freedom of movement and freedom to withdraw from projects in some reasonable staged way. Entitlements such as the entitlement to having one's religious and cultural group fairly represented at the level of personnel and planning, as well as some kind of 'equal entitlement' to access opportunities to go into space. The latter is a particularly complex kind of equality, one that will be difficult to

bring about across large populations only a tiny fraction of which could ever be sent into space. But it is an entitlement that we should take seriously and try to realize in some form if we are serious about democratization in the enlarged sense that I have in mind.

Democratization of this sort is also a selling point for space tourism as a way of making access to space available to more and different groups of humans. It is regularly appealed to by Elon Musk, Jeff Bezos, and Richard Branson, and has shaped their participant choice. Particularly during the 2021 race into space tourism between Blue Origin and Virgin Galactic. For example, the Virgin Galactic cabin was split between four men and two women, one of whom was Sirisha Bandla, the second woman from India to go into space, and the first to come back alive. Bandla hoped that this would pave the way to access for 'people from different backgrounds, different geographies, different communities' (Pandey 2021). The Blue Origin crew included Wally Funk, one of the survivors of the 11-strong Mercury 13 group of women who underwent the same training as NASA's first (all male) astronauts, and the only one to have actually made it into space; a belated instalment of justice.

Mae Jemison, who became the first Black woman to go into space in 1992, as a member of the Space Shuttle Crew for the STS-47 mission, reinforced the importance of such steps when reflecting more broadly upon the engineering accomplishment of Blue Origin: 'Space exploration has been part of human history' (CNN 2021). A thought missing from a good deal of the critical commentary. The obvious implication being that any exclusion from exploration is itself an exclusion from an important part of our shared history. Something to be taken seriously. When Gil Scott-Heron delivered his satirical 'Whitey on the Moon' in 1970, actual travel into space really was exclusionary in this way. A case of 'Whites only'. By the time of the 2021 space race, this was no longer the case.

In brief, amongst other things, democratizing space on the conception at work here involves a multi-sided inclusion of individuals and collective groups who have historically

been excluded, marginalized, or subject to one of the many forms of subordination to greater power and greater powers. This covers a considerable territory from all persons of colour and Indigenous peoples whose interests are the focal point of ongoing political protest; small states such as Luxembourg attempting to carve out a role in space expansion; states such as Nepal trying to access satellite technologies to deal with earthquake vulnerabilities; and more powerful states such as India and Japan with wealth and robust space ambitions but without the advantages of the historic Euro-American space powers. Finally, democratization when understood in these inclusive terms is not only an attempt to be fair. It is also a way to give content to the idea that space is the common heritage of mankind, an idea at the heart of the Outer Space Treaty (1967). This need not involve the claim that space itself is 'a commons' in the formal sense, just so long as it commits us to inclusion on the grounds that all have claim.

2. Distinctiveness of Role

Making sense of the multiple potential roles of Indigenous peoples within such an inclusive approach to democratization poses something of a problem. Obviously, it will not be good enough to regard those who go into space as automatically representatives of all of us, in which case Indigenous peoples would always have been included by proxy, just like everyone else. Assuming that the issues of participation and inclusion are much the same for Indigenous peoples and persons of colour also looks problematic when we reflect upon the distinctiveness of claims made within terrestrial politics. A classic exemplar here is the contrast between the struggle for equality and inclusion on equal terms by the Civil Rights Movement and Black Lives Matter and the focus upon autonomy and sovereignty, outside the uniform federally enforced rules, by political activists and representatives of First Nations in the United States (Deloria 1969; Walker 1999).

The point is, however, cautionary rather than a claim that this same contrast must mark all aspects of democratization. There are, after all, forms of inclusion such as crew membership, which is much the same in both cases. John Bennett Herrington of the Chickasaw Nation flew on the Space Shuttle to the International Space Station in 2002 as part of the STS-113 mission, becoming the first Indigenous American in space, but inclusion of this sort is still rather different from making sense of a distinctive Indigenous role. It is the kind of thing that we might underpin simply by an appeal to justice and as a recognition of historic injustice. But if we want to move from inclusion to democratization in the fuller sense, it is not clear that an appeal to considerations of justice alone will be enough. It may do some work but will require sturdy allies if we are to make headway. Elsewhere (Milligan 2023), I have suggested one such ally, 'the argument from belonging'. This is a pragmatic line of argument for a distinctive role for Indigenous peoples within space programmes based upon a certain kind of knowledge about belonging. Here, I will try to clarify the argument and will reflect upon its distinctiveness by contrast with another pragmatic argument for Indigenous inclusion, one that flows more directly from the focused discussions about 'extraterrestrial liberty' which have been going on for more than a decade (Cockell 2008, 2016).

As my concern here will be with clarification of the argument, the approach will be broadly analytic rather than interwoven with multiple quotes from Indigenous agents that readers can find elsewhere, and which help to support the view that there are already a multiplicity of attitudes towards space across and within different Indigenous communities. In other words, considering Indigeneity in the context of space expansion need not lead us to reaffirm some old assumptions about uniform Indigenous hostility to space programmes (Young 1987). And it need not lead us directly into some manner of hostility to current or projected human activities in space as a playground for wealthy White colonial settlers and their scientific and technological representatives. Critical engagements from Indigenous perspectives can, instead,

follow the approach of Deondre Smiles of the Ojibwe, which fuses critique and openness (Smiles 2020).

As indicated at the outset, the argument that follows is not that all Indigenous peoples can or should have a distinctive contribution, but merely that space expansion would benefit in a distinctive way from distinctive Indigenous input, and benefit in a way that goes beyond the gain in legitimacy for space programmes that might result from greater inclusion. This distinctive input could, in principle, come from some small cluster of Indigenous peoples, and need not involve any particular cross-section of the Indigenous 5 per cent of the world's population (World Bank 2021). It does not, therefore, attempt to capture all aspects of democratization but only a particular advantage of a certain limited aspect of democratization. And it does not assume that all Indigenous agents are bearers of the knowledge about belonging that is in question.

If we think in terms of establishing a stable human presence on the Moon or Mars, or about further forms of space exploration (the kind that may only be possible in science fiction), there is something intuitively appealing about this idea of a distinctive Indigenous role. After all, if we were to identify some ideal crew, we would probably want to include group members with experience of living in extreme environments and not only agents who might have visited such environments, written about them as non-Indigenous anthropologists, or participated in simulations inside analogues. In a sense, it is this intuition about *knowing how to cope* that I am trying to tease out and present in a more formal and precise way with emphasis placed upon the knowledge and not just the coping. So, let us call it 'the background intuition'. I want to draw upon this background intuition without any problematic reliance upon claims concerning actual space settlements which may or may not happen, and without appeal to scenarios in which humans boldly go beyond the bounds of the solar system, to explore other places. Instead, I will stick to the opening commitment to the permissibility of expansion into some

broader region of space. Put in other terms, the argument relies only upon the prospect of a level of space expansion that is extensive enough to make us think of ourselves (i.e. humanity at large) as now occupying more than the ground. We might then think of this as a matter of humanity's future involving a continuous movement between sky and ground, a future in which familiar concerns with belonging persist.

With these qualifications in place, the argument from belonging runs as follows. Space expansion is a cluster of multi-generational projects, some of which will have a sequel but many of which will be abandoned. Expansion will occur, but not necessarily in the ways that we want, or with the goals that we currently pursue. This places a question mark over the meaningfulness of our actions. Especially so, given that space programmes and expansion are not simply goods in their own right but rather are goal directed activities. Realization of goals, or of sequels to them that we ourselves might buy into, will depend upon the actions of others in the future, actions that we cannot guarantee or control. Much of what we do might dead end. One way to deal with the problem, as a problem about the meaningfulness of our actions, is to try and make sense of 'what runs deep within our human attitudes towards space'. That is to say, we can draw a distinction between matters of depth and a much more volatile set of concerns: idiosyncrasies, fashions, historically transitory views about sex, gender, and the family, economic and political doctrines rooted in particular phases of social development, and so on. If we place too much emphasis upon these more volatile and transitory concerns, then our plans and projects are more likely to be set aside. At least this is what our own attitude towards the projects of previous generations suggests. We have set aside core plans and projects of the nineteenth and twentieth centuries and few of us desire to live in ways that our predecessors would have had us live. Similarly, basing multi-generational space projects on shifting fashions in economic theory seems like a poor way to proceed.

Whilst many of our attitudes are volatile, and economic theories are transitory, a concern with belonging is not. Modern ideas of belonging in Western cultures tend to have a ground bias, a sense of disconnection between sky and ground. Even a tendency to rewrite insights which depend upon both as if they were sourced in an exclusively earthly way. Here, we may even think of theorizing about ecosystems whilst overlooking the fact that the very concept appeals to the Galilean concept of a system developed to make sense of planetary motion (Olson 2018),. (A qualifier to this is the uneasy appeal to Western cultures, which is at best a shorthand for a far more complex story.) By contrast, Indigenous cosmologies have an inbuilt sense of belonging that reaches beyond the Earth. A sense of continuous movement between sky and ground, a sense of belonging to a larger order of things than the Earth alone. These cosmologies are more than ecologies and, whatever their limitations if we mistakenly attempt to read them as primitive precursors of modern science, they do not suffer from the same kind of ground bias that our prevailing forms of belonging have so often fallen into.

For clarity, I do not think that Kepler or Tycho Brahe or Dante or Galileo fell into this same ground bias, but that it is something more recent and not a kind of carelessness but rather connected to our ways of being. Many of us have had no great need to see life on Earth in a larger context, although we now face the need for something more than ecologies. And whilst the concept of the 'cosmological' can sometimes sound a little too grand, the idea of a more cosmological perspective as a more than ecological perspective may help us to understand the challenges of coming to terms with belonging to a larger region of space. These are, again, matters of depth, matters that concern 'what runs deep within our human attitudes towards space'. And so the argument is that Indigenous cosmologies and the knowledge about belonging associated with them can help us to position ourselves more effectively to develop projects with sequels, rather than projects which end up being displaced. So ends the argument.

This is an argument with a significant number of moving parts, but none are especially complex or reach beyond familiar ways of understanding the world. Appeal is made to an idea of the meaningfulness of actions, and this might be disputed as a sort of fiction. However, the option of dismissing this concept is lost for those who have a commitment to space expansion on grounds that appeal to its importance for humanity. That, after all, would be a kind of meaningfulness. Besides which, disputing the concept of meaningfulness generally trades upon a conflation of (i) the idea that the universe is indifferent to what we want, and (ii) our ineradicable practices of treating some things as more important than others. The latter is almost certainly something that goes with being an agent of any sort at all. It certainly goes with any familiar way of being human. In other words, it is not optional. It is part of the canvas on which we paint our pictures about ethics and about human life. No picture would hold together without it.

One of the argument's distinctive features is that it is broadly pragmatic. This has been emphasized from the outset. The argument also does not depend directly upon considerations of justice. This does not mean to say that the importance of justice can be set aside but rather that we may need to bring more than one argument to bear when we try to understand the complexities of the democratization of space, and of Indigeneity in relation to space. Besides which, appeals to justice may motivate arguments but often they are not enough to motivate action. Effective arguments may have to appeal to practical advantages as a selling point if they are to be taken seriously within processes of policy formation for space programmes. The argument also leaves a good deal about the concept of 'belonging' unsaid. Further detail needs to be added. Nonetheless, the above sets out the core of a line of argument, and the line of argument does point towards the possibility of a distinctive Indigenous contribution. This marks it out from more familiar ways of arguing for inclusion.

3. Comparison with an Appeal to Liberties

The argument has distinctive features which we can see if we compare it with another plausible argument for inclusion that also addresses the idea of belonging, but in a slightly different way. Let us call this second argument the 'liberties argument' and regard it as a foil which can be used to highlight some good and bad features of the argument from belonging. The liberties argument draws upon an appeal to the special vulnerabilities of space and to the difficulties of sustaining anything approaching conditions of liberal democracy within space settlements. Again, for the sake of clarity, I suspect that both arguments are sound, or can be reformulated in terms which are sound.

The liberties argument runs as follows. Freedom in space will be just what Cockell (2015) has suggested: freedom in a box, subject to persistent pressures towards authoritarian control. Whoever controls the air supply will also have leverage over settlements. Reducing such dependencies, for example through modularity of settlement design, and multiplying the number of suppliers of the immediate requirements for human life, are key considerations. Avoiding monopoly in space really is an aspect of the democratization of space. So too is attitude towards place. In the light of multiple vulnerabilities and the adversities of living in extreme environments, the temptation will be to think of settlers existing in a state of war with their surroundings. Pioneers trying to conquer the places that they occupy. There is a familiar literature drawing upon such metaphors, from Cosmism, which situated space exploration in the context of a larger conflict between man and nature (Tsoilkovsky 1963; Yefremov 2004), through to Hannah Arendt's paper, 'The Conquest of Space and the Stature of Man' (Arendt 2006). Such ideas are likely to play into political vulnerabilities. They are likely to reinforce the pressures towards authoritarianism in space. After all, wartime conditions justify curtailment of liberties in near unique ways. Rather than drawing upon such a pool of dangerous metaphors, it would be better to draw from ways of being at home in a place, ways of belonging

which acknowledge the extreme nature of space environments in order to avoid any lapse into more belligerent, warlike ways of being and seeing. No doubt, both have a role, but the balance between them is important. And one of our best storehouses of ideas about how to be at home in extreme environments is Indigenous knowledge. Indeed, it is remarkable that we have yet to tap into such ideas more fully in order to understand the challenges of living in the difficult conditions of space. As indicated previously, if we were planning for an actual settlement in an extreme space environment, we would do well to draw upon knowledge and perhaps also some personnel with direct experience of life in another extreme environment such as the Arctic, or desert conditions, as well as personnel with more brief experience in terrestrial analogues.

Considerations of justice may well motivate both arguments. In my own case, they certainly do. I am looking for ways to show the practicality of justice. However, neither make a direct appeal to justice. They appeal instead to pragmatic considerations and to the sustainability of space projects. Both arguments are also consistent with the continuation of certain forms of terrestrial injustice. They perform some of the work which is required in order to support a fuller democratization of space, but they do not presuppose any leap into a set of ideal circumstances. They are also contributory arguments. That is to say, they give strong reasons in support of inclusion and the factoring in of Indigenous traditions, however these reasons could in theory be outweighed by other countervailing reasons. Someone might also reject either or both arguments without being guilty of a failure of rationality. Neither are conversation stoppers. Of the two, the liberties argument has fewer moving parts and makes no appeal to ideas such as the meaningfulness of our actions. That may be an advantage of sorts. Someone might also argue that more weight should be placed upon the liberties argument than upon the argument from belonging. However, it may turn out that the placing of emphasis upon one or the other is a matter of philosophical sensibilities rather than anything else. My own approach places more emphasis upon the argument from belonging, but this may draw upon

nothing more than a fondness for asking questions about meaningfulness and about what goes deep within a human life.

Be that as it may, the argument from belonging has at least some advantages over the liberties argument. First, it does not presuppose actual settlement but only the emergence of a significant larger than Earth human presence. Second, both involve an appeal to our human vulnerabilities, but in the case of the argument from belonging, the vulnerabilities in question are ineradicable, even in principle. With settlements, we can always imagine wonderful technologies and a point in time at which the box within which freedom is enjoyed happens to be so big and reliable that it will present few limitations beyond those of human life on Earth. What we imagine may not be fully realized, but at least in principle many of the vulnerabilities might eventually be removed. By contrast, our reliance upon future generations to continue multi-generational projects involves a vulnerability that can never be removed. Or, at least, it cannot be removed in the absence of some manner of 'conquest of time' of a sort that the Cosmists also believed in but which looks like a strictly fictional scenario.

Both arguments are also liable to face a set of standard objections, for example that Indigenous inclusion of almost any sort can all too easily lapse into cultural appropriation. The plundering of Indigenous traditions and appropriation of cosmologies in a search for something that we can use. Arguments with a pragmatic edge may be particularly vulnerable to a charge of consuming Indigeneity as a resource. The boundaries between some manner of cultural imperialism and democratizing may at points become blurred. There is danger as well as opportunity. However, the greatest danger of all may be that Indigenous peoples become 'superfluous', a concept that I borrow from Hannah Arendt and her discussion of the banal evil of Nazism (Arendt and Jaspers 1992). 'The Jew' simply had no place within the Nazi economy and within its conception of a revival of Germany. Whilst its application to Indigenous peoples needs considerable further development (and I am certainly not making a claim about actual

genocide), what matters in the present context is the idea of lacking a place within the human community, and within our shared projects. And so, when Mae Jemison speaks about space exploration as part of our history, I take this idea very seriously and see it as having implications of an important sort. Those outside the process or rendered superfluous to the process are rendered superfluous to a part of our history, a part already of growing importance and one which is likely to shape all other civilization-level changes in the not too distant future.

Finally, there are practical questions in both cases about exactly how inclusion can work. But it seems likely that reflection upon Indigenous cosmologies and the sense of belonging that both arguments appeal to will only be viable against the backdrop of a multiplicity of other kinds of inclusion within space programmes. From inclusion as project personnel, to cooperation when drawing down satellite information about water supplies in Indigenous territories, and so on. In other words, the kinds of inclusion that we see NASA and the Navajo working towards. Without this, it is difficult to imagine how Indigenous knowledge about belonging and space exploration could ever be brought together in meaningful ways. Again, the concept of the meaningful may play a role.

4. Democratic Constraining

If we are satisfied that the argument from belonging has its problems but is no more problematic than many arguments which we have good reason to accept, this will still not end our difficulties. We will still have the task of trying to make sense of what it shows. For example, Indigenous knowledge about belonging has been appealed to, above, in a rather loose way. There is no indication of whether the knowledge in question involves information or knowhow, or some special combination of the two. This ambiguity about the kind of knowledge that I am suggesting we might benefit from also applies in the case of both arguments. However, by using an understanding of science which is constrained by the opening/framing commitment

to democracy, we can form a clearer conception of the kind of knowledge about belonging which is at stake. One that reduces worries about appropriation. This is the point at which the arc of this story returns to the theme of democracy and how it impinges upon our ways of thinking about other matters, such as science as well as justice.

This problem about the kind of knowledge at stake may be framed in terms of a traditional philosophical distinction between knowing how and knowing that, but the terminology need not matter, just so long as we allow that there are different kinds of knowledge, and that one kind of knowledge need not reduce to any other. If the relevant and useful kind of Indigenous knowledge is a matter of knowing how, then it will not reduce down to propositional knowledge. It is tempting to think about knowledge of this sort, instead, as a kind of practical wisdom. And if our motivations are those of justice and inclusion, we will have strong reasons to favour more of a practical wisdom reading. After all, if it is only information that is at stake, the knowledge in question might be acquired from some or other groups of Indigenous people, whose role could then be ended. There would be no further need for them. That really would look like appropriation, or the extraction of knowledge as a resource. If, instead, practical wisdom is involved, then it will be much harder to set aside the involvement of actual Indigenous agents as knowledge bearers. Wisdom of this sort arises within a set of practices from which it might not easily be disentangled. The relevant agents cannot be used and then pushed aside.

However, we can hardly settle this matter simply by appeal to considerations of justice if we are to insist upon the pragmatic standing of the argument. And we may want the knowledge in question to be (at least in part) a matter of practical wisdom. But that hardly makes it so. Instead, I will suggest that there is a non-arbitrary way to choose between these two competing readings of the relevant Indigenous knowledge about belonging, a way which aligns with our

concern for justice but does not depend upon it, a way which is shaped by our understanding of science in the context of democracy.

To be more precise, at least for policy purposes, we should maintain a distinction between regular science and Indigenous knowledge and, more specifically, we should not appeal to Indigenous science as simply one more regular scientific discipline. A more problematic way to make the point would be to uphold the distinction between 'Western' science and Indigenous science. More problematic because the idea of Western science can itself be a little misleading. There are many things that Indigenous peoples may know which are of interest to science, and there are many things known which can figure as data for science (in the sense of regular science), and which may shape its practices. But accepting the possibility of weaving together knowledge systems is rather different from saying that Indigenous storytelling is itself nothing other than science as we ordinarily think of it, in spite of the multiple deep metaphysical commitments and quasi-religious commitments built into such storytelling. In so far as we are thinking about science at a policy level, we have good reasons to separate out deep metaphysical and quasi-religious commitments from science in the regular sense, or at least to do so within a broadly liberal democratic political setting in which policy formation may be directly informed by science, but not by any special religious or metaphysical viewpoint (Duhem 1991). On matters of the latter sort, we expect our democratic political systems to be up to a point neutral. When it comes to policy formation, as opposed to other contexts where we might address matters in a less constrained way, we embrace something close to 'methodological naturalism' as a hallmark of regular science.

For the sake of clarity, methodological naturalism is not the same as a generalized method of science of the sort once sought after by Karl Popper and others. It is an overall adequacy condition that lots of different theories (scientific and other) might satisfy. And it involves official neutrality about more specialized religious and metaphysical viewpoints which are

unlikely to command assent across large political communities. It does not involve hostility towards such viewpoints. It is not, for example, a coded assumption of atheism, but a genuine neutrality over a variety of matters taken to sit outside of regular science. The latter is then treated as a limited discourse. One that does not try to speak about everything or claim to account for every kind of knowledge. Finally, methodological naturalism is embraced for reasons, and not because science has to be thought of in this way under all circumstances. A concept of science will track other social practices. Science may talk about natural kinds but it is not itself a natural kind, fixed by the structure of nature itself. It is entirely conceivable that some society may do things differently, and that we might still recognize their way of doing things as science, yet we ourselves live in broadly liberal democratic societies, with a plurality of religious and metaphysical commitments, as well as shallower ideas of dangerous sorts which sometimes aspire to be classified as science but which serve only some special set of interests which, if embraced, would violate a democratic commitment to citizen equality. In brief, people living as we do have reasons to use the concept of science in more restricted ways. If our goal is the democratization of space then this will also be the approach towards science that we should adopt.

This will automatically exclude the possibility that a good deal of Indigenous knowledge, and Indigenous cosmologies in particular, count as regular science. Yet, we may still remain committed to the view that they contain a good deal of knowledge and could constitute science of a special sort which ought not to be reduced to regular science. Indigenous cosmologies in particular happen to be especially relevant to the argument from belonging as they involve narratives about belonging that might help us to make sense of what it is that runs deep within our human attitudes towards space. But a desire to make sense of them simply as regular science would lead us to regard the knowledge in question as information rather than practical wisdom, or some combination of the two within which practical wisdom has a diminished role

to play. After all, ease of transmission, and the possibility of results being checked by others, are integral to practices of regular science. This is not to deny that there is also a good deal of knowhow involved in scientific practices, but theories, models, and claims must be readily understandable to anyone with the relevant technical expertise, irrespective of their personal history or background. In the absence of any idea that Indigenous knowledge should be classified as science of this more strictly limited sort, there is less pressure to make a similar set of assumptions. There is no reason to read the knowledge in question as information rather than practical wisdom. Concerns about appropriation and what happens once the knowledge is transferred may also be reduced.

5. Conclusion

The arc of this chapter has moved from and back to a concern with democratization, and the possibility that some manner of democratization may be possible as we expand into space. There are, as we would expect at this stage of the discussion, a good many ambiguities that need to be resolved, and a need to examine Indigenous knowledge and ways of belonging in ways which are particularly geared to the needs of expansion into space. The analytic approach, with its focus upon concept development and argument building, also has its limits. All of these things are true. Nonetheless, the approach has its strengths. One is that the distinctiveness of the role assigned to Indigenous knowledge, as well as its pragmatic underpinnings, may take us further than an appeal to justice alone. Another is the clear direction of travel for further research if the central argument is to be upheld. A ‘good-making’ feature of the approach is that we can draw a larger programme of research out of it.

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