Geoengineering and the Sacred: A Brief History in Four Characters
Bronislaw Szerszynski

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Geoengineering, the large-scale technological control of climate processes in order to offset anthropogenic global warming, is at this stage merely a prospective technology, yet it is already a controversial one. The idea of attempting to bring about deliberate large-scale changes in a complex, dynamic, chaotic system such as the atmosphere is highly ambitious. Like rDNA biotechnology and other new and emerging technologies before it, it is likely to provoke objections from opponents which are religious or implicitly religious in nature; for example, that it is 'playing God' – overstepping the proper and safe limits of human freedom and control.

But it would be a mistake to see the influence of religious or cultural beliefs merely on the side of those who are sceptical or critical of new technologies. Cultural and religious ideas can also be seen as shaping the very idea of geoengineering. In *Nature, Technology and the Sacred*, I argued that in order to understand our current 'technological condition' we have to locate it within the context of long historical trends and transformations in Western religion (Szerszynski, 2005). In this perspective, I want to show how that kind of analysis can be applied to geoengineering, to reveal how it is an aspiration that has roots that are a lot longer than the modern period (Fleming, 2010), and is entangled with enduring themes about human agency and nature in Western cultural history.

In order to do this I will take a selection of 'characters' from history who were ascribed the power to control atmospheric phenomena, and explore them as models for the 'maker of climates' that is imagined in geoengineering discourse.

My first character is the **sacred king**. In many premodern societies the role of the king was not just political but also ritual: they were seen as maintaining a vital link between human societies and the cosmos. In Mesopotamia, for example, the strict observance by the king of the annual cycle of festivals was seen as crucial for the maintenance of life and prosperity (Frankfort et al. 1949). The sacred kings of Tara in Ireland were married to the Earth goddess, which was believed to help ensure a constant supply of agricultural products. If the climate changed, threatening famine, this was a sign that the king had failed to maintain the goodwill of the goddess, which would often result in him suffering ritual mutilation, sacrifice and burial (Dalton, 1970; Kelly, 2012).

The second character is the **cunning woman** or man of medieval European culture, who performed various divinatory, medical, and religious roles within peasant communities. According to the popular culture of the time, a range of rites, premonitions and spells could be deployed in order to understand and manipulate the invisible bonds between things in the natural and supernatural worlds, including influencing the weather (Muchembled, 1985, p.71-79). This often led cunning folk to attract accusations of witchcraft and Satanism, of using weather magic to create storms to sink ships or unseasonal hail and frost to blight crops (Briggs, 2002, p.78-79). Yet beliefs in weather magic in Europe predated such accusations of diabolism, and were

manifest in pre-Christian pagan practices of appealing to spirits and deities to spare a village from storm or to bring rain to the crops (Horsley, 1979, p.86-87).

My third character is **the magus** of Renaissance Europe. Influenced by the texts of the occult European Hermetic tradition, these elite thinkers believed that they could use their knowledge of the natural and occult virtues of objects to attain great powers over natural phenomena. As Heinrich Cornelius Agrippa put it, magicians could "attain power over nature, and perform operations so marvellous, so sudden, so difficult, by reason of which … the stars are disturbed, deities are compelled, the elements are made to serve" (Easlea, 1980, p.99).

Finally, let us consider the **experimental philosopher** as conceived by Francis Bacon (1561–1626), often seen as the originator of the scientific method. Bacon argued that the systematic investigation of natural phenomena through experimentation would enable the collective human mastery of nature, a "kingdom of man" in which humanity would enjoy the conditions of ease and harmony with nature that they had enjoyed before the Fall (Noble, 1999). His utopian novel *New Atlantis* describes "Salomon's House", a college of learning with a range of facilities, including towers half a mile high where atmospheric phenomena can be closely observed, and "great and spacious houses" where they could create artificial snow, hail, rain and lightning (Zagorin, 1998).

With this final character we arrive at a point that is similar to how we might imagine the modern geoengineer. In Bacon's vision we can see what sounds like a very well-resourced modern research institute. He describes something very close to modern science with its organised, collective character, its norms of objectivity and cooperation, and the pursuit of knowledge as an end in itself. Bacon also prefigures science's contemporary use for the common good in major civilisational projects like combatting disease and anthropogenic climate change.

However, let us not just discard the earlier characters outlined above. Note how they shift in complex ways back and forth between collective and individual benefit; between social, conversational models of weather control versus causal ones; and between emphases on keeping things stable or effecting change. And note also the following broad pattern that can be discerned as we move through the history of religion and culture towards modern times.

From harmony to dominance. Ancient societies typically understood social order and power in terms of *harmony* with the cosmos, and saw the aspiration to mastery over nature as dangerous and foolhardy. In such societies, over-reaching technical ambition was seen as disconnecting those who wield it from the wider sacred and social order, and likely to lead to disaster and punishment – as seen in the myths of Babel, Prometheus and Icarus. Power came to those like the sacred kings who, instead, aligned themselves with the forces of nature. And this is a theme that is retained as it is transformed in our history above: even Bacon, with his emphasis on controlling nature and improving it, felt that "nature to be commanded must be obeyed" (Bacon, [1620] 1960, p.39).

From inside to outside. Earlier understandings of the manipulation of the material world typically regarded the person who wields that power as an actor within the world

– as an agent within a web of mutually interdependent agents. Even the Renaissance magi, who felt themselves to have access to secret knowledge about the occult properties of things, only thought they could alter the world if they operated within its organic order (Merchant, 1980, p.169). With Bacon we can see a decisive shift: the modern understanding of mastery over nature is based on the idea of knowing the world from outside – of disentangling oneself from the world in order to gain objective and practically effective knowledge about its causal mechanisms.

From moral to technical action. In earlier societies the practical arts were also understood as bound up with morality – about the moral character of the person trying to wield power, and shared ideas about the good. Even the Renaissance magus's ability to manipulate the world is understood in social rather than purely technical terms, and thus to depend on his moral character. The first Renaissance magician, Marsilio Ficino (1433–1499) thought that to gain magical power the magus must enter into the "common love" that binds the world together, whereby "the lodestone attracts iron, amber straw, brimstone fire, the Sun draws flowers and leaves towards itself, the Moon the seas" (Easlea, 1980, p.94). Bacon too linked knowledge and power to character; but for him nature would submit to the scientist if he purified his mind from emotion and disciplined his body, making it a suitable receptacle for the rational mind (Keller, 1985).

From active to passive matter. The ancients understood craft production and other forms of technical action as co-operating with a matter which had its own desires and goals; this notion of matter as active, even alive, shapes the thought and actions of our first three characters above. But Bacon advocated a "masculine birth of time" – a new start for the world's history, after which it would be dominated not by the unruly female principle of generation but by the male principle of rational control (Merchant, 1980, p. 168). Bolstered by the Reformation's insistence on God's utter transcendence from and of divine mastery over his creation, this idea of matter as passive would help to lay the ground for science's aspiration to describe the world as a mechanism operating according to mathematical laws.

Situating climate geoengineering against this long, complex history suggests a number of questions. Firstly, if we try to conceive what a 'maker of climate' would be (Galarraga and Szerszynski 2012), is our imagination too constrained by the contemporary secular mind-set? Were a historian to look back on current geoengineering debates from the vantage point of a few centuries hence, would they really conclude that we had fully understood the cultural currents and shifts that shape our thinking? Secondly, what difference might an awareness of religious and cultural history make to discussion about the ethics and governance of geoengineering? Can we learn from earlier ideas of harmonious and moral action, in ways that do not simply translate them into modern terms and lose their distinctiveness? Thirdly, what relevance might this kind of inquiry have to the technical aspects of geoengineering? If the idea of geoengineering had emerged in a culture shaped by a very different trajectory, for example, one in which technical knowledge and action are seen as taking place within the world, and in which matter is understood as having its own agency, would it involve very different ways of thinking about how one alters or stabilises climate – ways which in the long term might be more productive?

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