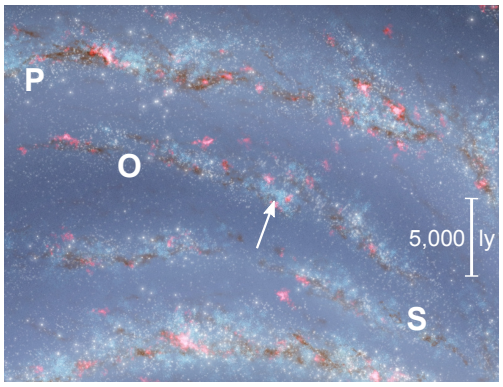
An end to steer by, and a means

Michael Allan

Two things fill the mind with ever new and increasing admiration and reverence, the more often and more steadily one reflects on them: the starry heavens above me and the moral law within me.[1] — Kant

Nothing seems more natural than to view the stars as a field of freedom and morality as a regime of constraint. Nevertheless I invite you to consider a strangely opposite view in which morality, by leaning upon a universal, physical constraint of nature, can enable us to break free of contingency and steer our own future. The physical constraint it would lean upon for this purpose is the prohibition on superluminal motion. We must assume this, therefore, as our first premise:

(P1) Let all communications be limited to light speed.



F1. The sun (arrow) is located in the Orion Spur (O), between the Perseus (P) and Sagittarius (S) galactic arms.

Nothing can travel faster than light. To understand why this matters, it helps to look around and compare the scale of our surroundings to the speed of light. We are located in a relatively small structure of stars and star-forming regions called the Orion Spur, the nearest stars of which populate our night skies. Although small in relation to the overall galaxy, it is still large enough that the distance travelled by light in a single year (a light year, or 'ly') would be indiscernible in figure F1.[2] Even the distance it travelled in a lifetime would be barely discernible. Light emitted by the sun on the fateful day the Goths sacked Rome, for example, has yet to work its way across the Orion Spur's width; a span of some 3,000 ly. Having travelled since the year 410, it is roughly half way across.

Even the most urgent of news cannot travel very quickly through the stars. But sometimes a limitation is a good thing, especially in human affairs. The philosopher and historian of ideas, Isaiah Berlin, who was much concerned with political ethics and the dangers of violence in pursuing collective ends, once recommended that the best we might hope for is some kind of limiting arrangement that served to protect 'differing groups of human beings—at the very least to prevent them from attempting to exterminate each other, and, so far as possible, to prevent them from hurting each other'.[3]

Perhaps such a safeguard is offered in the limit of light speed. The slow crawl it imposes on communications certainly makes nonsense of the notion of 'star wars'. Even the most catastrophic war could not communicate with any force across interstellar distances; the speed limit is small enough, and the distances large enough, that together they form a barrier to both natural and artificial extinction events. Life could radiate across that barrier (just), but death could not.

Leave aside for a moment the question of how to cross such a formidable barrier. Think instead of the destination on the other side. Imagine how it would feel to be there: A child is looking at the night sky. His mother points, 'Do you see that star?' she asks, 'That's where we come from. We also have people there, and there,' she says, pointing to other specks of light, one by one. Then she gestures across the whole of the starry sky, 'This is where we live,' she says, 'We will always live here.'

So a mythic story is told that will always be true, a promise-gift from mother to child. Together they reaffirm and carry forward to the next generation an understanding of what it means to be human. That understanding succeeds in capturing and conveying the essence of humanity precisely because it is timeless; a trillion years later, and the same story will be retold under a starry sky. For any who have crossed the threshold and entered into the inheritance of humankind, it will always be so.

The alternative is extinction. For us, therefore, the night sky presents a more uncertain prospect. Looking to the future, we see both possibilities hanging in the balance. On one hand, we see all those children looking back at us with wonder in their eyes; on the other, we see nothing at all. Exactly one of these possibilities is fated to become a fact, then to hold for all time, thus defining humanity for what it is. Nobody knows which of these two ends will eventually become the definitive fact, yet the clarity of the choice is

something we can deal with in terms of present-day moral theory. Our second premise is designed, therefore, to come to grips with it:

(P2) Let reason be the supreme value.

Assume that reason is the ultimate good for us; if pressed, we would do anything to save reason. This assumption brings several advantages to a moral argument. For one, it expands the argument to its proper scope: morality can be a useful concept only if its principles are, as Kant puts it, 'so extensive' that they 'must hold not merely for human beings but for all *rational beings as such*'.[4] With this expansion, then, we can now deduce the main principles of a moral theory.

Table 1. Moral theory and practice.

		Theory	Practice	
form	(M2)	Morality promotes a maximum of personal freedom compatible with equal freedoms for all	Maximizing personal freedom	means
form	(M1)	Morality relates personal action to a universally collective end	Mythopoeic overguidance	means
matter	(M0)	Morality purposes the endless continuity of rational being	Forever retelling the myth	end

The material principle of the theory (M0, Table 1) follows almost directly from the two premises: while the laws of nature (P1) enable rational beings to assure themselves of a continuous existence, as opposed to extinction, that same continuity would also be necessary to fully develop and realize the supreme value (P2). So we take that continuity as the material end of morality. Here we are treating morality as a purposeful, constructed facility on which the full weight of our most cherished value may come to rest. Thinking like engineers, therefore, and wary of failure, we must now design a structure to bear that load.

Accordingly, one span of the structure (M1) we should anchor in the individual, and extend formally to the end. This positioning arises from analysis of the end. We might reach it without anyone really trying, but that is unlikely. More likely it will require a great deal of personal, wilful agency. Therefore the M1 span attaches to personal action and extends from there into the endless continuum of rational being. The form of this extension is collective, since rational being reproduces and develops in social spaces that are independent of any individual; and the width is universal, since anything less would increase the risk of ultimate failure. The stakes are high, because a chancier, more human-bounded construction might lead, for all we can ever know, to a cosmos that is forever devoid of reason.

A similar prudence gives rise to the other formal principle (M2). While success depends on personal action, we cannot know in advance which particular actions are necessary. The goal is too distant and the eventualities too complex to judge with certainty. But people are numerous. They can explore many paths simultaneously; so that, if a given action does not reduce anyone's freedom to act, then it can hardly reduce the likelihood of eventual success. Success depends on opportune discoveries to which the formal theory is blind. Therefore the optimum strategy for the blind strategist is to maximize everyone's freedom of action. Anything less would again increase the risk of ultimate failure and an irrecoverable loss of the highest value. The tipping points between success and failure are many, and each hinges on the freedom of an individual whose identity is unknown. Like the collectively aimed M1 span, therefore, the individually aimed M2 span is designed to bridge a tremendous void of uncertainty and risk.

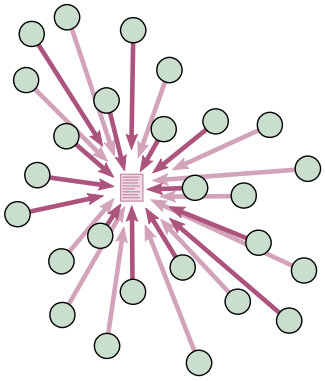
In translating this structure from theory to practice, it helps to first translate the architectural analogy of lines and spaces to a procedural one of steering the future. The practical goal is to institute a steering mechanism for the modern context, one that engages with the all-pervading laws, plans and other action norms by which modern society deliberately regulates itself. Let us therefore append an intermediate, procedural principle to the theory behind the practice. This is the discourse principle, as formulated by the social philosopher Jürgen Habermas:[5]

(D) Just those action norms are valid to which all possibly affected persons could agree as participants in rational discourses.

For our purposes, we may think of D as the shape that is necessarily taken by the normative canvas whenever it is held in tension by the moral frame (M1, M2). There it hangs like a powerful sail captured by an equally strong mast and boom. As we enter into an exploration of the practice, however, perhaps the most important image to hold in mind is that of the individual as a hero, hand on tiller, eye on the stars, directing everyone's future while limiting no one's freedom.

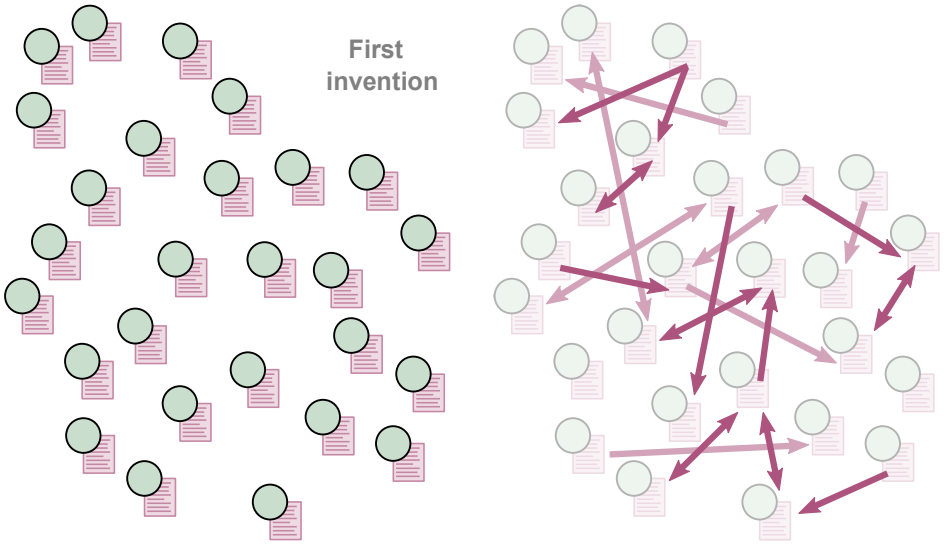
Maximizing personal freedom: necessary inventions [6]

The technical goal is to compose consensus norms (D) while simultaneously accommodating a maximum of personal freedom (M2). Therefore we must reject the usual method of consensus composition on the ground that it limits free expression. No author can express herself freely through a draft text while 25 others (to say nothing of 25,000) likewise attempt to express themselves through the same draft (figure F2). If that is the whole of the solution, as it is with wikis, then we must look elsewhere for a better design. We need not look far, however, because the determinant of freedom in this case is obvious: every author must be allowed a draft of the text that is independent of, and formally equal to every other.



F2. The usual method: authors push contributions to a single, central draft.

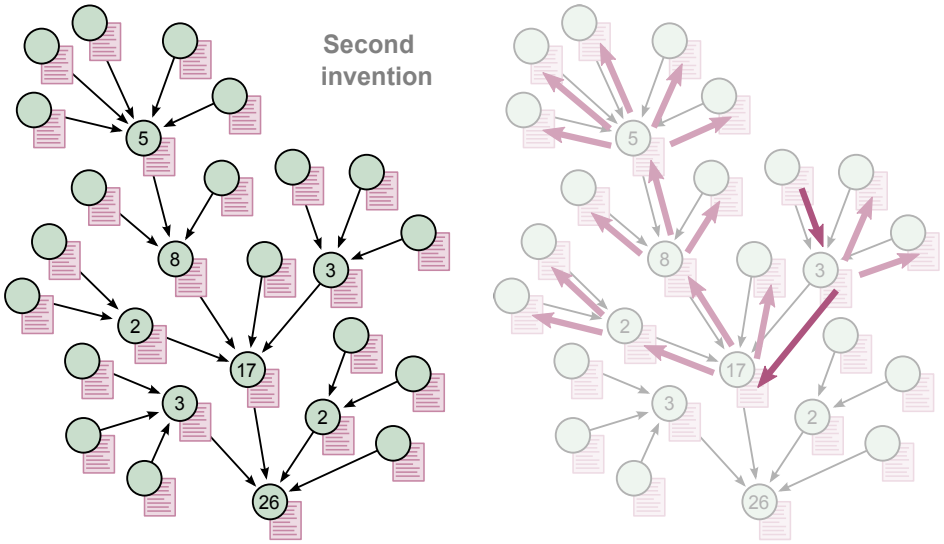
The corresponding determinant of consensus, then, is equally obvious: all authors must be able to remove unwanted differences between their drafts. In practice, this means copying sequences of text from draft to draft. Together these two facilities of independent authorship (left of figure F3) and peer-to-peer transfers of text (right) are characteristic of a pattern of composition known as 'recombinant text'.[7]



F3. A recombinant text is distributed in multiple drafts, one per author (left). Authors pull contributions from peer to peer (right).

But while the recombinant transfers on the right imply a *potential* for reaching agreement (as indeed a particular pair-wise difference is eliminated with each transfer) nothing indicates the actual, overall *extent* of agreement. A recombinant text allows for, but cannot in itself formalize and express a consensus. For that, we must introduce a voting method. We must be careful in the choice, however, because the conventional methods are all designed for mass voting, which means a relatively small number of candidates. And mass patterns of communication often sit poorly with peer-to-peer. In this case, the network effects

of mass voting would soon collapse the complex, open structure of the recombinant text onto a relatively small number of candidate drafts, eventually reducing it to the imploded star pattern of figure F2, with its unacceptable disregard of free expression.

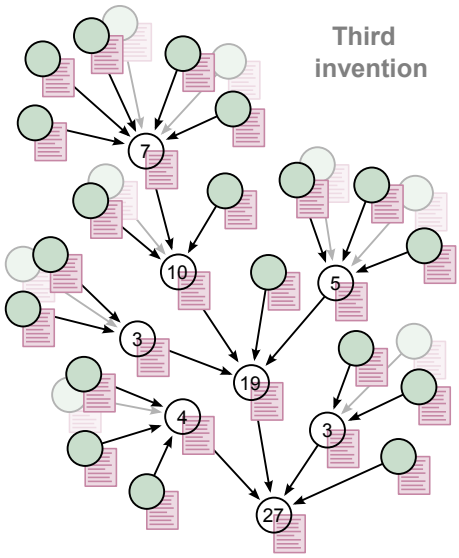


F4. Introducing transitive voting to express consensus in a recombinant text. Numbers show the total quantity of votes received by each author (left). Now the textual contributions tend to flow on the same lines as the votes (right).

Free expression is better upheld by transitive voting[8]—although it does leave one problem unsolved. Both the solution and the unsolved problem are visible in figure F4. On the solution side, transitive voting facilitates a consensus without systematically forcing it. All authors and other persons are eligible to receive votes. Votes received are carried along with one's own vote wherever it goes; together they cascade like raindrops down the branches of a tree. The crucial thing to understand is that freedom of expression applies not only to text changes, but also to vote changes; one may shift one's vote without restriction, or withdraw it at any time. So now we have *two* formal freedoms to uphold for each person.

The problem remaining to solve is that both of these freedoms are likely to be forfeited, in practice, by persons who receive votes (candidates). A candidate who speaks for her voters no longer speaks for herself. As her personal draft is now a group draft, and her personal vote a group vote, she has lost all formal means of individual expression. This is most apparent for a major delegate (e.g. 17 above) or a root candidate (26). Her responsibility to her voters weighs on her actions and ties her to a position that is not properly her own. To be sure, a similar loss will affect the entire forest, as even leaf situated authors will tend to assume the role of vote attractors, and, in anticipation of becoming candidates, surrender their freedom of expression to that end. A mechanism that demands such a sacrifice is not yet a complete solution. Something is missing.

Apparently the task remaining is to decouple the roles of candidate and person, and so (once again) free the person. We can accomplish this by using a device known as a 'pipe'.[9] A pipe is an impersonal surrogate controlled by a pipe minder, appointed in turn by the pipe's immediate voters. Each pipe carries votes like a delegate, but its own vote never counts. So it represents a group, or other association of persons, without *also* represent-



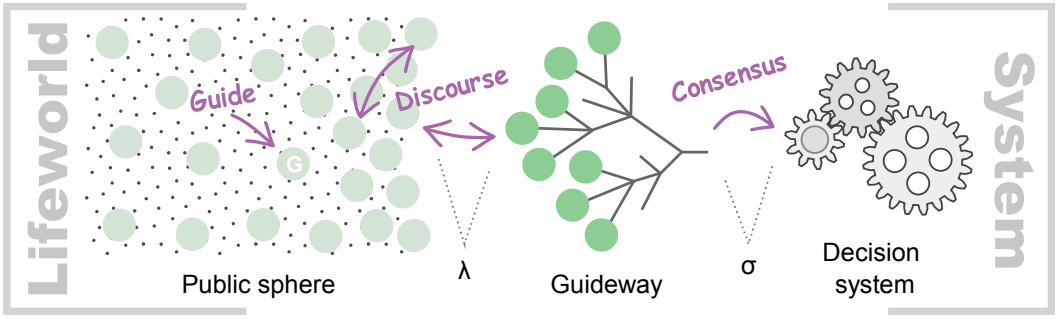
F5. The introduction of zero-weight pipes (hollow circles) frees all persons (green) to occupy leaf positions.

ing a person. The liberating effect of pipes is illustrated in figure F5, where they are introduced among the internal candidate positions (hollow circles), consequently freeing the persons of those candidates to move outward to leaf positions in the canopy (faded green discs). Even the person of the root candidate is now able to cast a vote of her own. This explains why the vote flow to the root has now increased from 26 to 27. Complete voting freedom is thus restored; all persons are now able to participate as leaf voters, each freely shifting his or her vote to settle on whatever branch or tree suits the moment.

Complete editorial freedom is also restored. In this case, note how the two, seemingly incompatible requirements of theory are met. On one hand, the relatively constrained text flows required to maintain consensus (D), which we therefore drew in figure F4, may now be reproduced within the piped, internal structure of F5. On the other hand, the unrestricted flows required to maintain personal freedom (M2), which we therefore drew in figure F3, may now reappear externally among the leaves of F5. For this, imagine looking down on the outer, leafy surface of F5, and there seeing the criss-cross text flows of F3.

Mythopoeic overguidance: steering the future

The piped tree structure that we obtained in the previous section is especially suited to large-scale steering applications. Not only does it solve the basic problem of unforced consensus, but it does so by formalizing a marriage between an unorganized realm of freedom at the periphery (figure F5, leafward) and a stratified system of constraint at the centre (rootward). This makes for an especially promising solution because modern society has a similar, bipolar structure. As a first approximation to a design, therefore, we can introduce the piped tree (call it a 'guideway') between the two poles of society:[10]



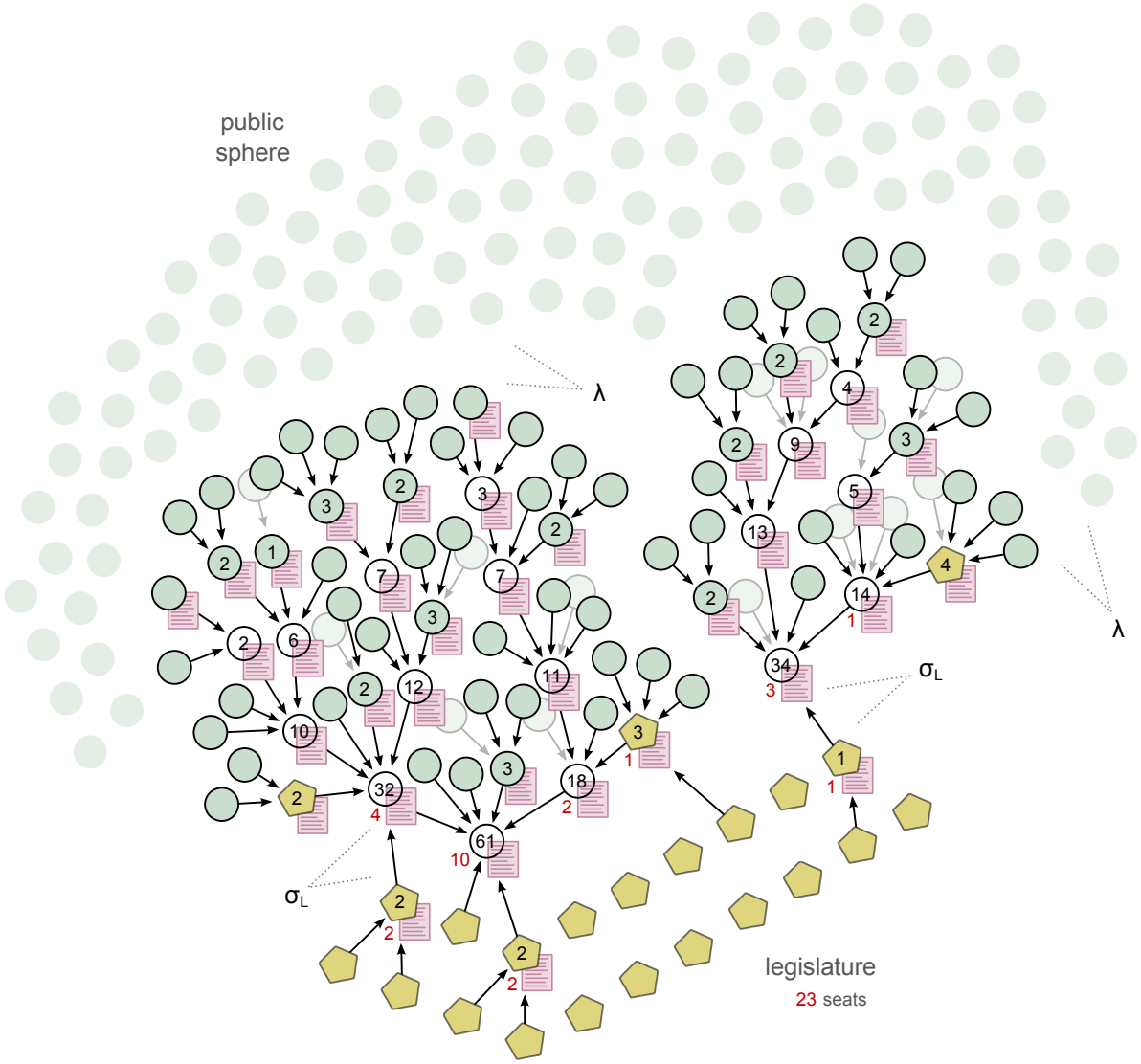
F6.

If we look at where the guideway must interface with society along the leafward edge (figure F6, λ), and there pencil in the requirement of rational discourse (D, which we have yet to meet), then it seems fitting that this edge of the guideway should interface primarily with that aspect of society known as the 'public sphere'. The public sphere comprises all the social spaces in which persons are free to gather and discuss the problems of society, and has always carried within it, throughout its history, the ideal expectation of a course of political action that is guided not by the contingencies of tradition, power or money, but independently through a 'public process of critical debate' and 'the unforced force of the better argument'.[11] Accordingly, we should pencil in the person of the 'guide' (G) within the public sphere.

Habermas classes the public sphere as part of the broader conceptual pole of society known as the 'lifeworld', from which society is viewed in terms of its symbolic reproduction through 'the fabric of everyday communicative practice'.[12] The other conceptual pole is that of the 'system' (right), which views society in terms of its material reproduction through 'ethically neutralized' and 'norm-free social structures', principally an economy and bureaucracy, whose regulatory effects are realized "beyond the actors' consciousnesses".[13] Against this, the root of the guideway formalizes a consciously constructed, normative consensus. This makes it clear that the interface on the system side (σ) would be dealing with those parts of the system that are sensitive to formal consensus; above all with the electoral systems, legislatures and executive offices that convey decisive power in a modern democracy. Call these 'decision systems'.

Bearing in mind that figure F6 is still only a preliminary design, let us now envision a particular application of it. Figure F7 shows a snapshot of a law guideway. The crucial thing to understand in this particular case is that each seat of the legislature (yellow) is simultaneously targeted by a separate *election* guide-

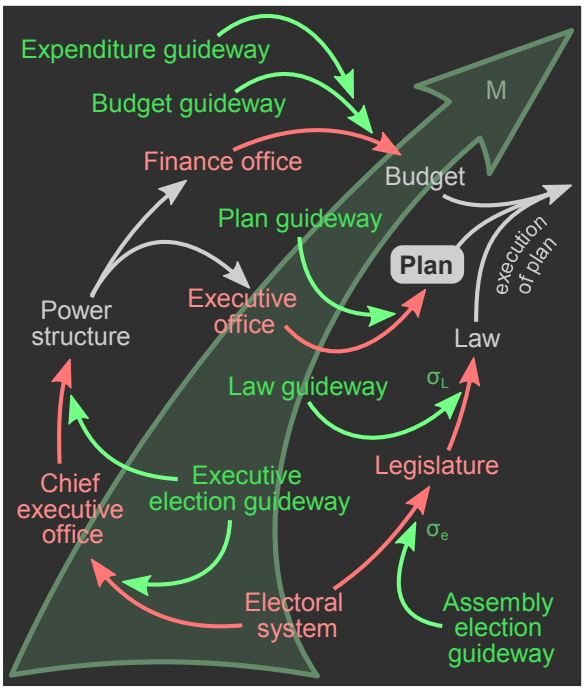
way (figure F10) that runs in parallel and keeps running through the next election. Seated members who hope to be re-elected will therefore be careful to monitor both types of guideway: not wanting to lose primary votes to rival candidates in the *election* guideway, they will prudently support the same bills as their local electors in each *law* guideway. So the members in figure F7 are moved to support the consensus bill with their own primary votes, which, of course, are still unofficial at this point. But if the rising tally of those votes (red) ever betokens a solid majority in the assembly, then that majority will turn around and vote the bill officially into law.



F7. Detailing the guideway/system interface (σ_L) in the case of a legislative decision. Primary voters in the law guideway are maintaining a rough, unofficial consensus on a draft bill, currently 61 to 34. Elected legislators begin to join in the voting. A separate tally of their in-house votes (red) shows them just 2 votes short of an assured majority in the official assembly, having 10 and needing 12.
(Primary turnout and assembly size are reduced for sake of illustration.)

Granted a law can be guided in this fashion, and all it implies, there is still something fundamentally lacking in this pattern of guidance. Figure F8 shows the pattern expanded in scope to include a planning issue, one that depends on the law of F7. Everything looks complete from a system point of view. The red

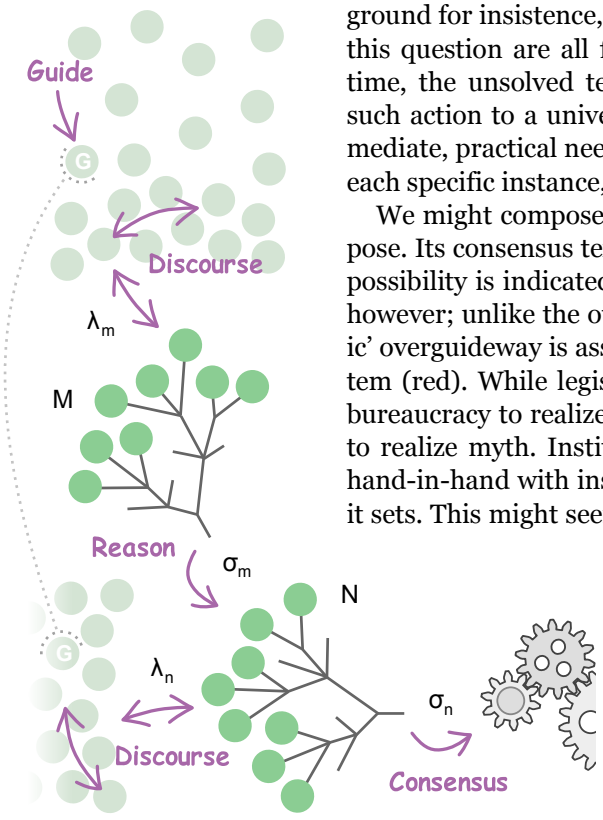
arrows of the decision network trace a sufficient rationale for the enforcement of the norms (law, plan and budget), each of which can be seen as an indirect effect of an ultimately electoral cause. Here is the rational backbone of modern democracy, and the σ interface of each guideway depends on it (green arrowhead) and works to strengthen it. For instance, we saw how σ_L (figure F7) relies on electoral predictions that are realized through σ_e (F10) to causally bind the current actions and future re-election prospects of the incumbent legislator. A similar mechanism underpins the effectiveness of the plan and budget guideways. But even if that mechanism worked perfectly, it would be insufficient from the viewpoint of the lifeworld *upstream* of those guideways. There the validity of a norm depends not on elections, but on a specific consensus that is formed in rational discourse (D). In all such instances, the first demand of reason will be the question, Why? From what cause and to what purpose would we execute this plan? Or enforce this law?



F8. A plan issued through a network of decision systems (red) and associated guideways (green).

When asked with insistence, the question is ultimately mythic, eventually demanding a full-scope explanation of where we come from and where we are going. Yet there *is* ground for insistence, because the laws, plans and other norms that give rise to this question are all formal standards of personal action, while, at the same time, the unsolved technical problem is to formalize a practice that *relates* such action to a universally collective end (M1). It would therefore fill an immediate, practical need to proactively answer the would-be mythic question, in each specific instance, with the help of an actual, universal myth.

We might compose that myth by employing a special guideway for the purpose. Its consensus text would then express the correct course to steer by. This possibility is indicated by the broad arrow M in figure F8. Note the difference however; unlike the other types of guideway, this myth-making, or 'mythopoeic' overguideway is associated with no pre-existing, pre-instituted decision system (red). While legislatures and courts exist to realize the legal code, and a bureaucracy to realize the administrative plans, modern society is unequipped to realize myth. Instituting a guideway that makes myth, therefore, must go hand-in-hand with instituting a system that reads it, and maintains the course it sets. This might seem infeasible at first, given the history and constitution of the modern state, but a likely solution is suggested by the way in which the mythic answer is now being demanded. Since the demand arises entirely in connection with the o*ther* newly introduced guideways, those in which laws, plans and other norms are composed, we can take all of those together as the missing 'system' that steers society in obedience to myth. This solution is shown in figure F9, extending the design sketch of F6.



F9. A conventional norm guideway N is itself guided through a mythopoeic overguideway M.

Now whenever a demand for ultimate rationality is raised along the public interface of a guideway

(λ_n), the drafters can meet that demand by inserting into their drafts a reference to the myth; for example, 'We affirm the universal consensus myth as our cause and purpose in composing this norm.' Such references, appearing in whichever drafts feel the need of them, comprise the overguidance interface (σ_m).

With this, the first guide (G) is ready to steer. She begins with an idea of the destination. Ordinarily it might be of any scope, whether local, or universal, or something in between; but in the very first, enabling instance of guidance, the scope is necessarily universal in both space and time, and therefore mythic; G conceives of a destination that is common to everyone who will ever live. Her strategy for attaining it is one of public persistence; she makes her arguments in public and keeps them there, ever present, for as long as she is convinced of their validity. Eventually those arguments will carry her idea across the mythopoeic interface (λ_m).

Suppose this happens too slowly to please her. Then she herself moves across the interface and into the overguideway (M). There she finds a rough consensus already formed, having taken root on a simple, but abstract draft: to the effect, 'We want to create a better future for ourselves and our children.' Agreeing with this, she too casts a vote for it; but then also composes her own, more expansive draft as a concrete elaboration of it. This approach is crucial; because the voting is transitive (F4), the votes can now shift upstream to her version of the text smoothly, one by one, without ever breaking (nor even diminishing) the hard-won consensus on the root draft.

If the guideway as built *does* support a maximum of personal freedom (M2), then the burden of validating these overguideway drafts is ultimately transmitted to the broad, public sphere beyond λ_m—the same sphere that already validates all of scientific theory. Its rational discourses will now weigh these new, mythic 'hypotheses', not only in their claims to objective truth, but also subjective truthfulness (sincerity) and intersubjective rightness (morality).[14] The sustained pressure of public critique and public voting will then mould the fallible text of the myth, shaping it ever closer to total validity. G's version of the text is just the first, substantive step on that evolutionary path.

But a*ll* normative texts are judged by the same criteria of validation, and against this common fulcrum the mythic consensus now gains purchase as a steering lever. On learning that a particular norm is inconsistent with the myth—the plan of F8, say—G joins in the public discussion of that text, too (F9, bottom left). 'To agree to a course of action and then ignore that agreement,' she argues, 'is both insincere and morally wrong.' Again, her strategy is one of public persistence. If necessary, she enters the formal guideway (N) and personally helps to move the text forward. She knows that the text of the plan (like that of the myth) is ultimately constrained to evolve along lines of increasing validity, a goal that *also* includes staying in line with the myth. By furthering such evolution in general, therefore—across all the laws, plans and other norms of society—she and the other guides are able to steer the future of humanity along a valid, agreed course.

Forever retelling the myth: the material practice of rational being

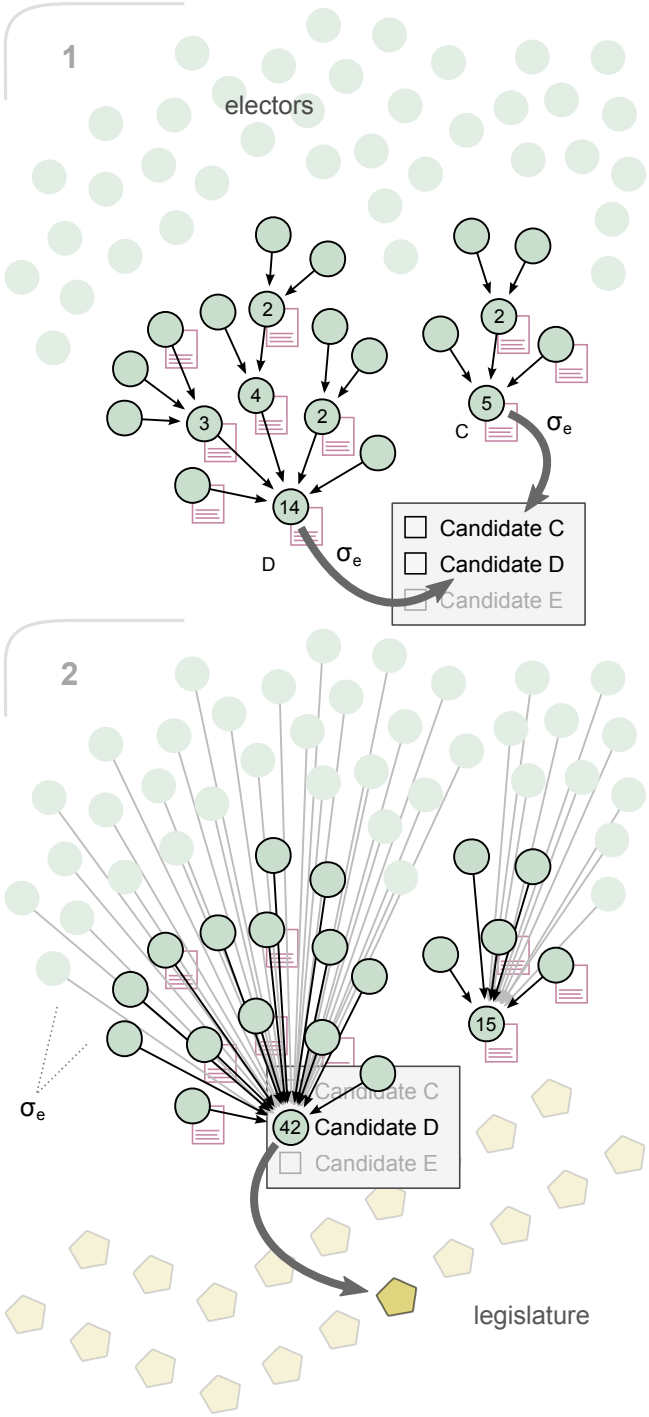
Rational being cannot be maintained in a continuous line without the telling and retelling of myth, for myth carries the knowledge of origins and the acknowledgement of purpose that are essential to practical reason itself. It runs like a conductor between past and future, equalizing their substance and exposing it to the present. At the outset, we left our descendants looking back in time from a safe vantage among the stars. We can imagine what they are thinking; that assurance of safety they enjoy is the creation of a people who had none. But it takes only a turn and a backward look for us to share in their perspective. Danger and imminent crisis are timeless in retrospect, as are the countless deprivations, failures, and trial-and-error achievements that informed the steps of our passage, even to our creation; for the line of our descent ran not only through history and prehistory, of course, but also through the ages before language and thought. We entered the last, great crossing to a new environment as a Devonian fish, some 400 million years ago. The anthropologist and literary naturalist, Loren Eiseley, describes the venture to land with empathy: 'It was not the magnificent march through the breakers and up the cliffs that we fondly imagine. It was a stealth advance made in suffocation and terror, amidst the leaching bite of chemical discomfort. It was made by the failures of the sea.'[15] Myth has the capacity (when told with art) to convey the meaning of such persistence, and to carry it over the next threshold.

The future of humanity is necessarily of mythic construction, our ultimate existence hinging on our ability to invent and evolve a story so convincing it becomes immortal. What is necessary to the means of steering, therefore, becomes essential to the end; the perpetual telling and retelling of the myth becomes our only holdfast to the mythic assurance of safety, once won. Since that assurance depends on sustaining a modicum of expansion, it also depends on sustaining a memory of the reason. This then is the condition of rational being in the universe, to be always conscious of our origin and purpose; to ride on a sea of contingency, of risk, and only by a knowing effort keep afloat.

We loved the earth
but could not stay.[16]

— Eiseley

Addendum



F10. The two-stage guideway/system interface (σ_e) between an assembly election guideway and the electoral system. **1**) Long before the election, local electors are continuously casting primary votes for each other in the guideway, most of which cascade to experienced law guides (magenta). The leading vote recipients (C, D) place themselves on the ballot for the upcoming election. **2**) On election day, the primary voters re-cast their votes into the electoral system proper, while the remainder of the local electors (faded green) tend to vote in the same proportions. So the guideway prediction is realized and D is elected to the legislature.

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1. Immanuel Kant, 1788. *Critique of Practical Reason*. Translated by Mary J. Gregor, 1997. Cambridge University Press. **5**:161.
2. Figure F1 is modified from an original drawing by Robert Hurt, 2008. NASA/JPL, public domain. http://www.nasa.gov/mission_pages/spitzer/multimedia/20080603a.html
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5. Jürgen Habermas, 1992. *Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy*. Translated by William Rehg, 1996. MIT Press, Cambridge, Massachusetts. p. 107.
6. The inventions described in this section were implemented as experimental, social-software prototypes under project Votorola, 2007-2013. http://zelea.com/project/votorola/home.html. Michael Allan, Thomas von der Elbe and Christian Weilbach contributed to the implementation.

   Specific design credits follow.
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8. A limited form of transitive voting (single step) was described by Charles L. Dodgson (Lewis Carroll), 1884. *The Principles of Parliamentary Representation*. Harrison and Sons. London. pp. 36-40.

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9. The concept of pipes as impersonal surrogates originates with Thomas von der Elbe, 2012. http://mail.zelea.com/list/votorola/2012-June/001380.html
10. The gears in figures F6 and F9 are modified from an original drawing by Nevit Dilmen, 2009. Wikimedia Commons, public domain. https://commons.wikimedia.org/wiki/File:Gears.svg
11. Jürgen Habermas, 1962. *The Structural Transformation of the Public Sphere: an Inquiry into a Category of Bourgeois Society*. Translated by Thomas Burger, 1989. MIT Press, Cambridge, Massachusetts. pp. 27-31, 51-54, 99-101.

    Between Facts and Norms. pp. 306, 541.
12. Jürgen Habermas, 1981. *Lifeworld and System: a Critique of Functionalist Reason*. Volume **2** of *The Theory of Communicative Action*. Translated by Thomas McCarthy, 1987. Beacon Hill, Boston. p. 138.
13. Ibid. pp. 117, 178, 185.
14. The three categories of validity claim are defined by Jürgen Habermas, 1981. *Reason and the Rationalization of Society*. Volume **1** of *The Theory of Communicative Action*. Translated by Thomas McCarthy, 1984. Beacon Hill, Boston. pp. 234-42, 329.
15. Loren Eiseley, 1957. *The Immense Journey*. Random House, New York. p. 54.
16. Epitaph of Loren and Mabel Eiseley. From Loren's poem, The little treasures. *Another Kind of Autumn*. Charles Scribner's Sons, New York, 1977. p. 57.

    The sailboat of the endpiece is by Virginia Frances Sterrett, 1928. Illustration for *Arabian Nights*. Edited by Hildegard Hawthorne. Penn Publishing, Philadelphia, public domain. http://cizgilimasallar.blogspot.ca/2011/09/virginia-frances-sterrett-arabian.html