Translations in Braided Ribbon Networks

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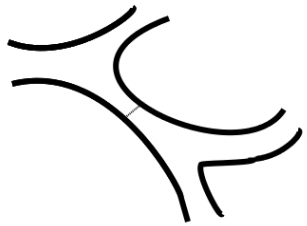
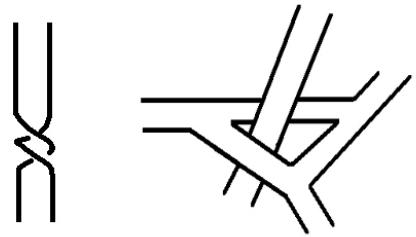
OUTLINE

Braided Ribbon Networks

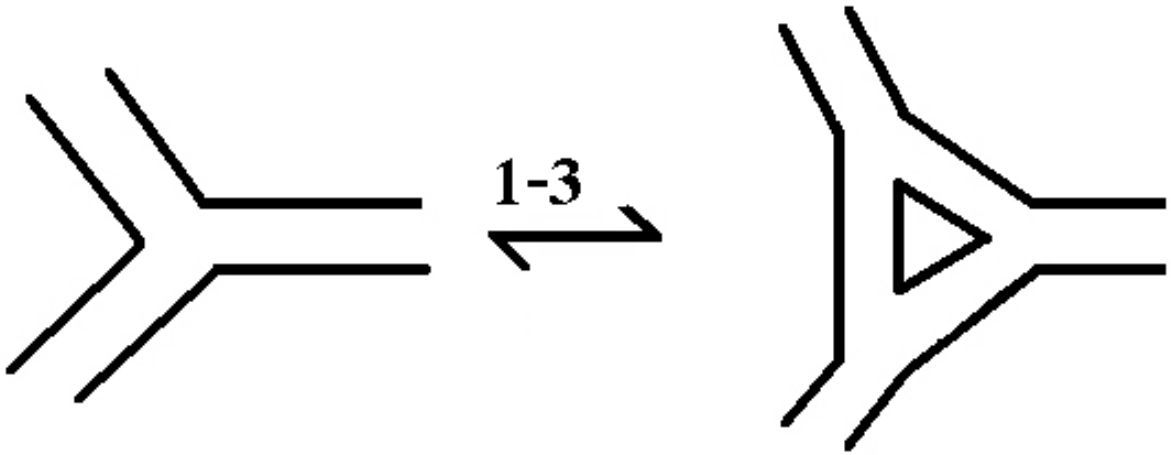
Networks composed of unions of ‘trinions’

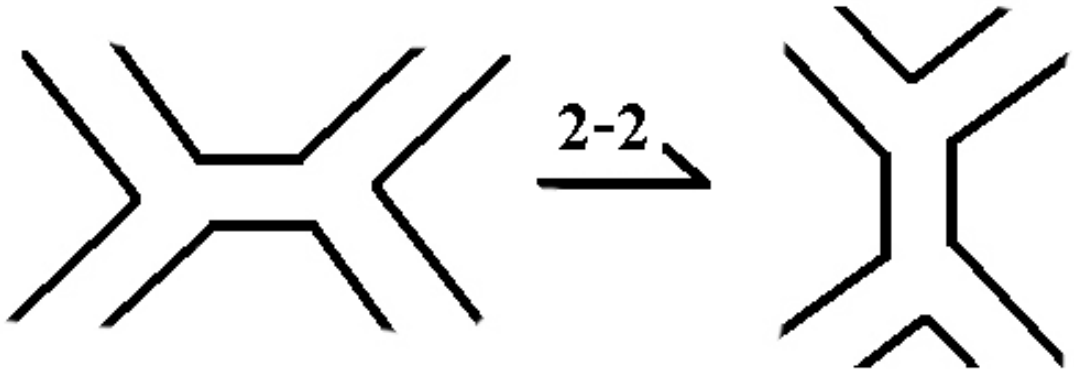


Include twists and crossings

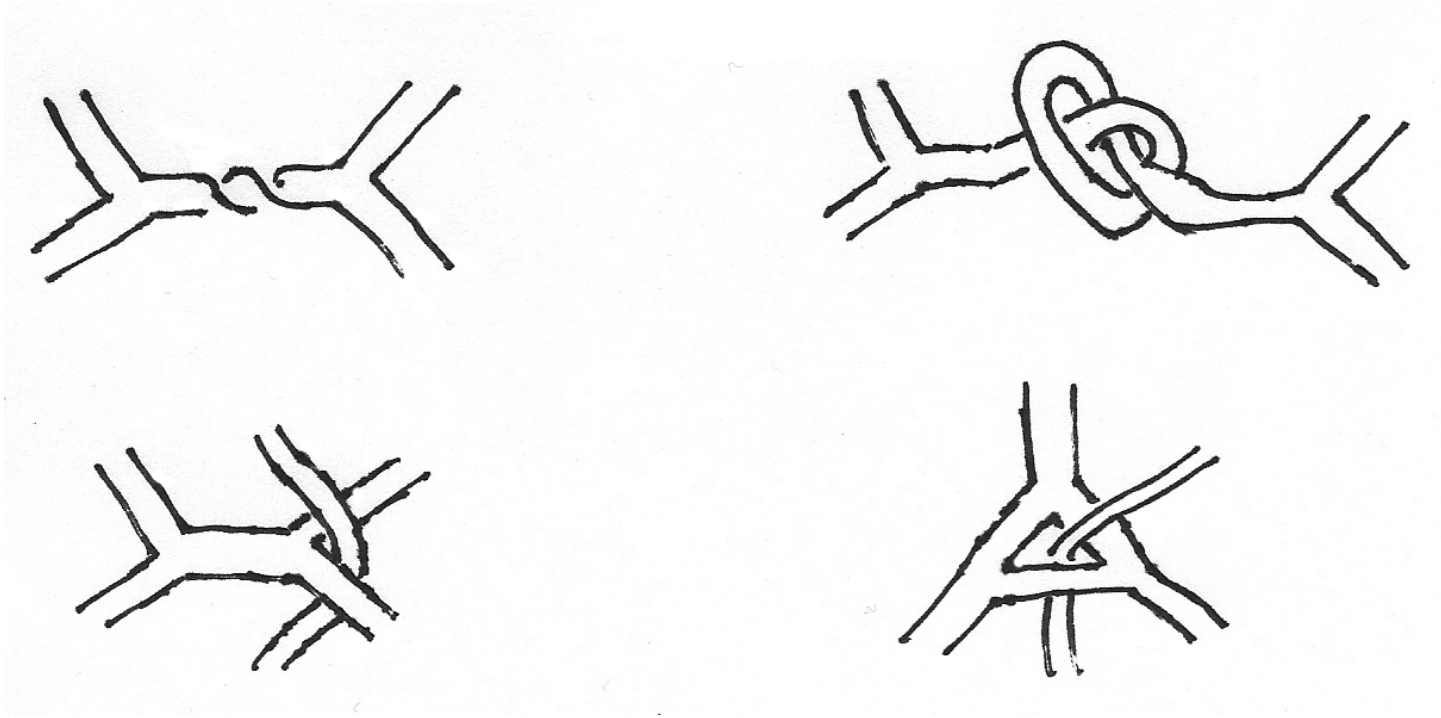


Evolution Moves



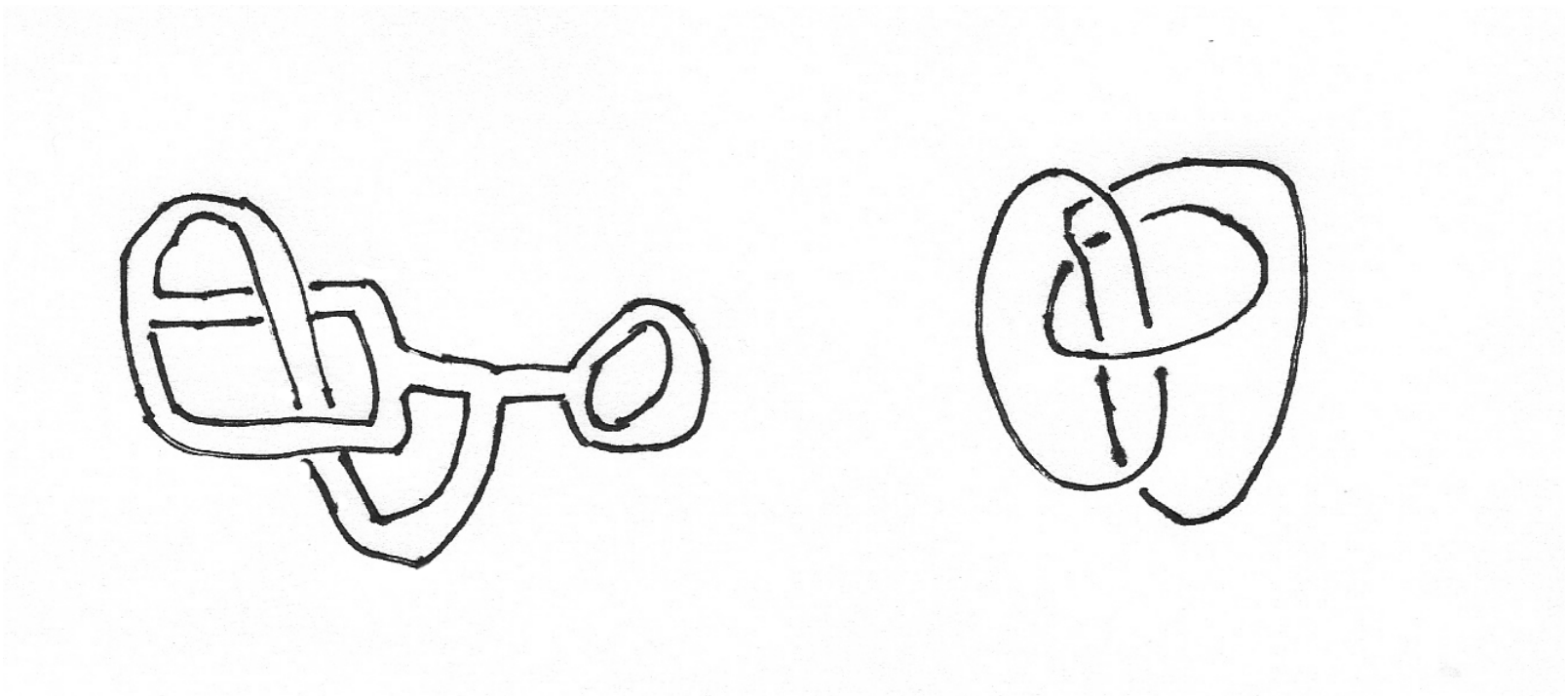


Impossible Moves

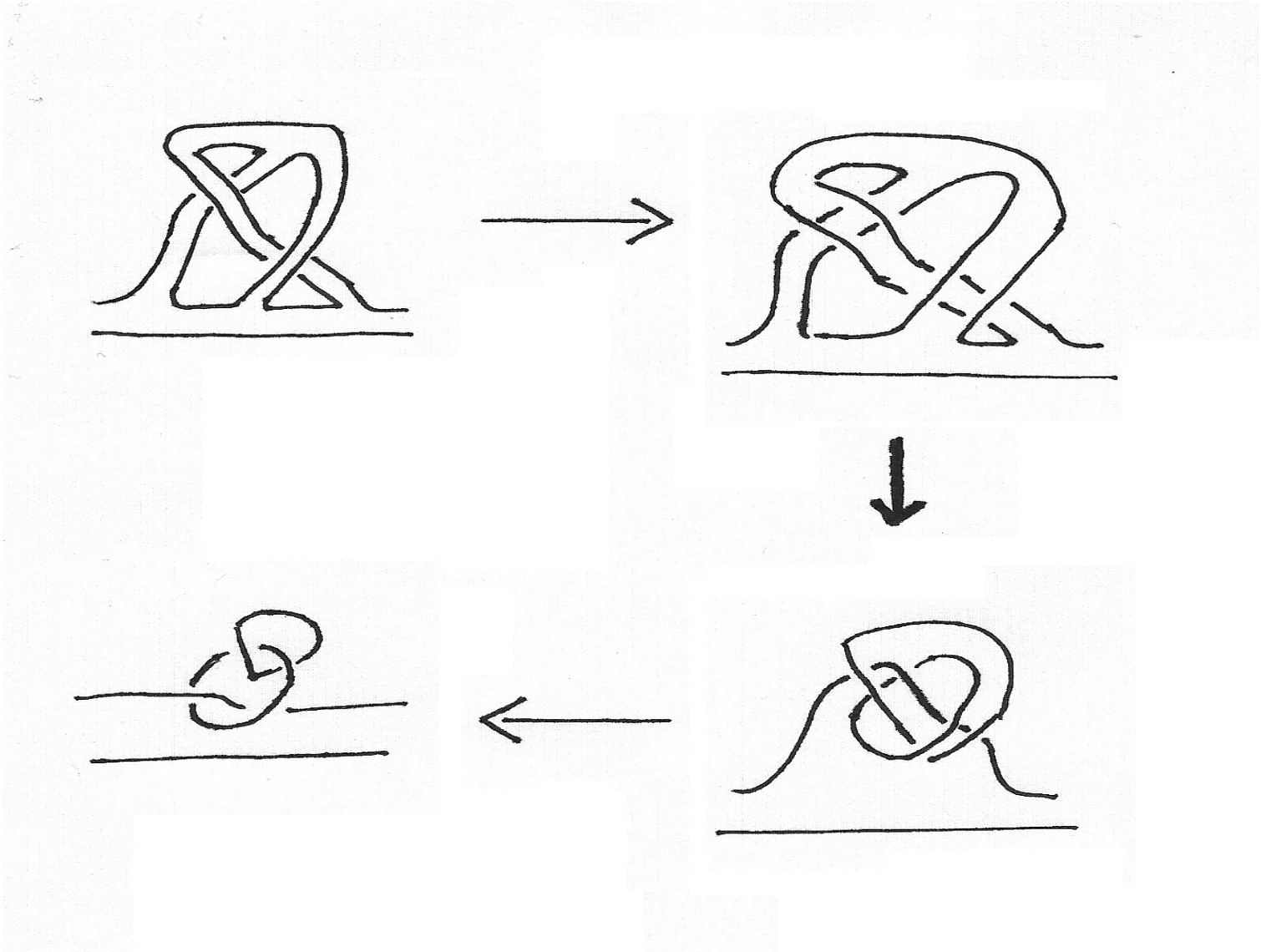


The Reduced Link

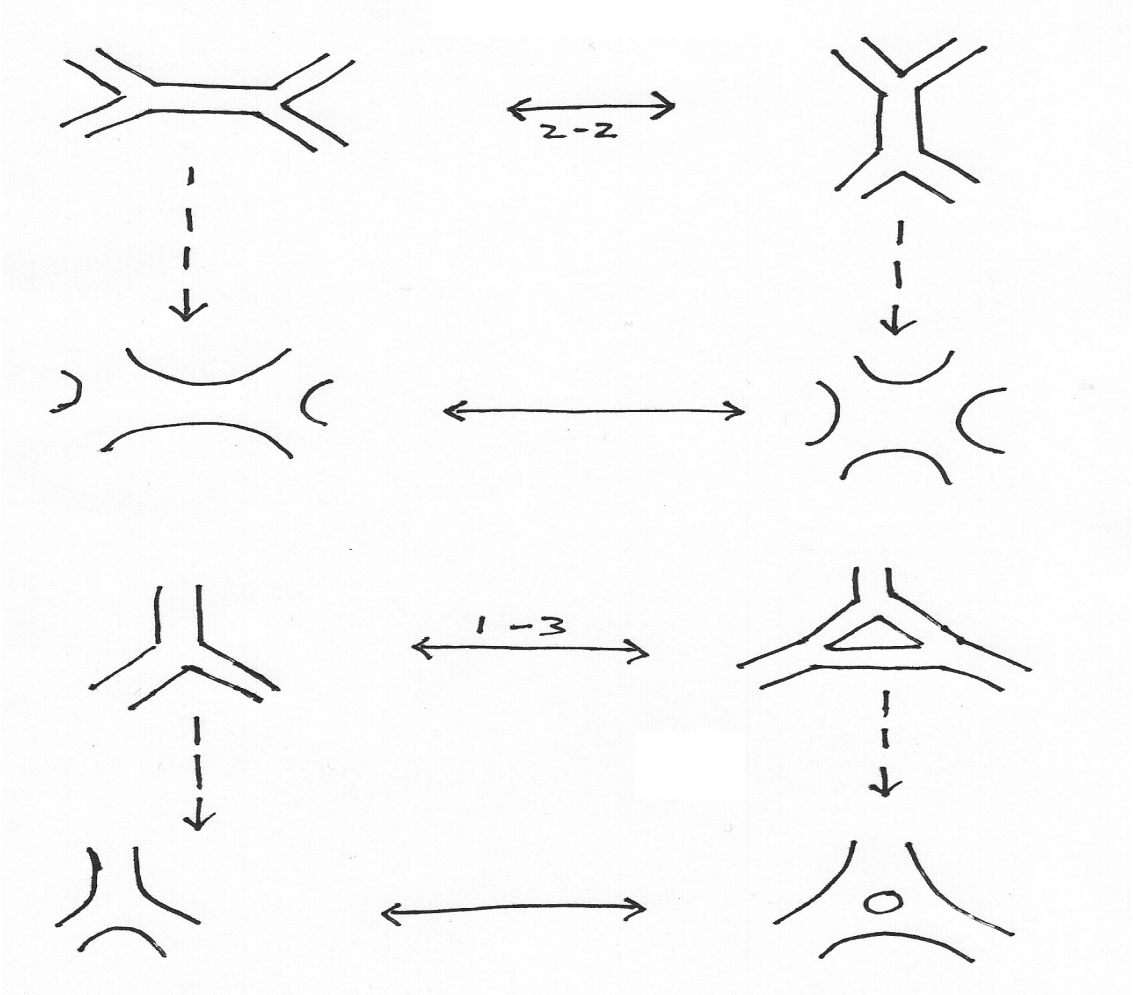
Found by replacing the ribbons with just their edges and then removing all unlinked unknotted closed curves.



Evaluating the Reduced Link

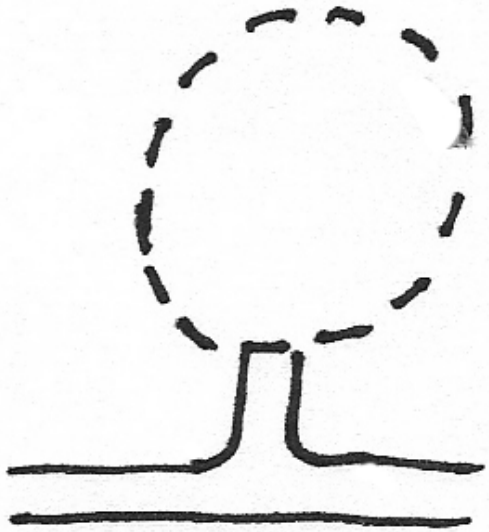


Invariance of the Reduced Link

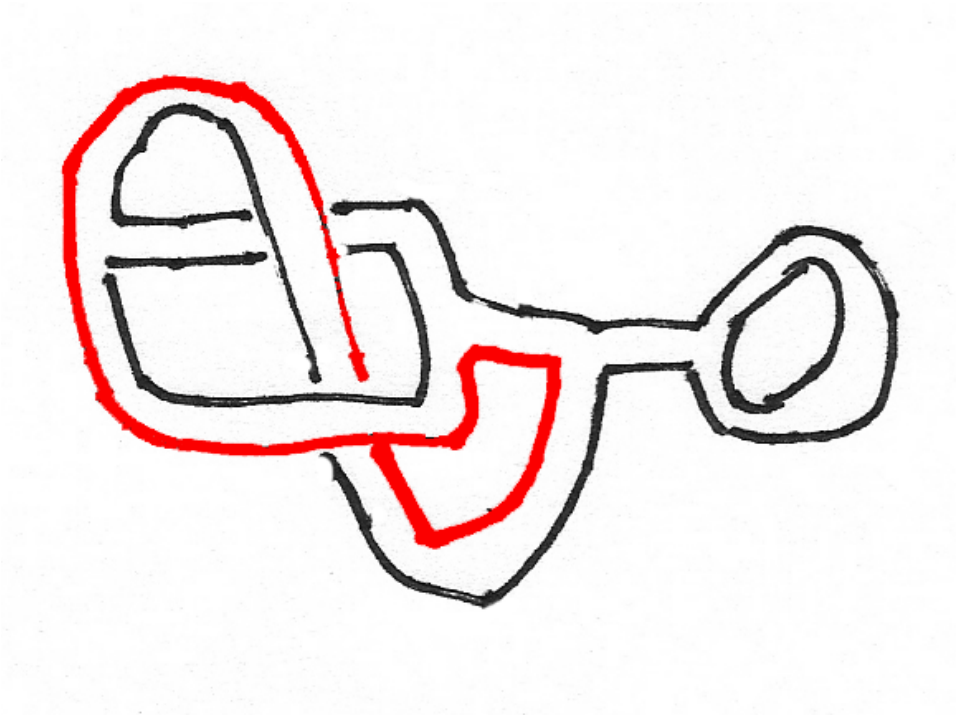


Isolated Substructures

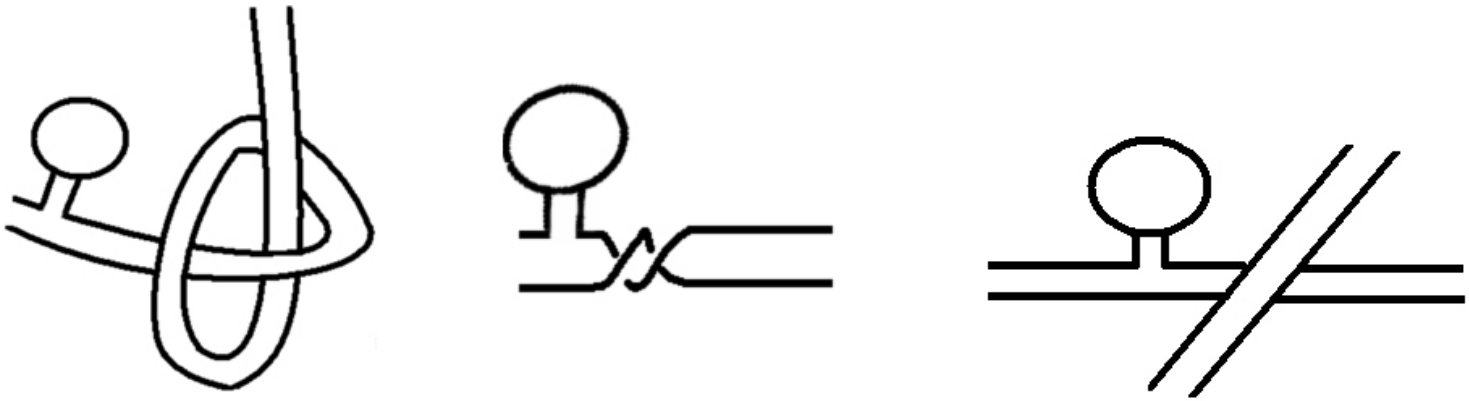
Objects that separate out from the rest of the network, only connecting via a ‘tether’



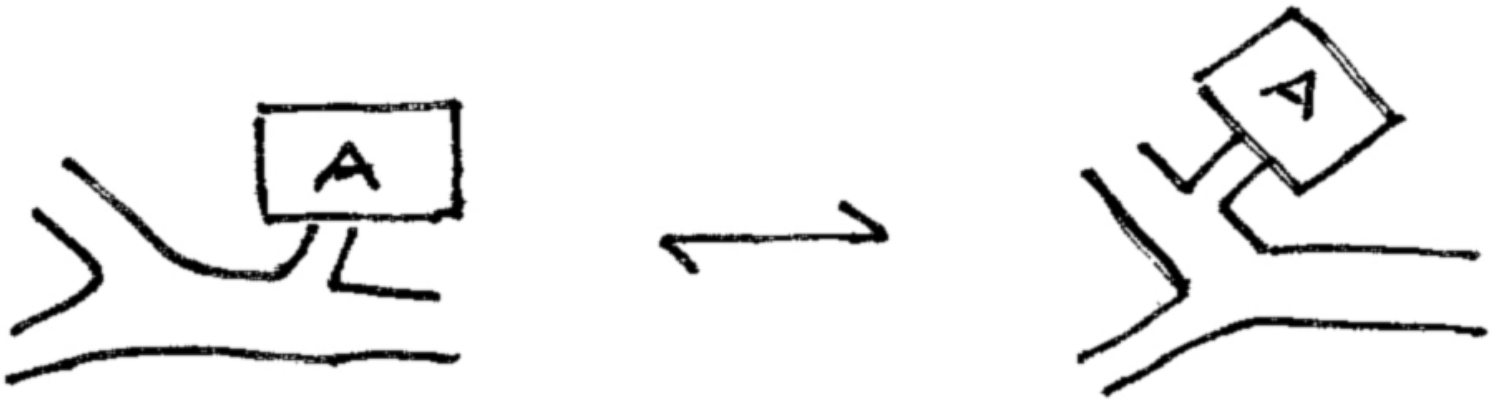
Edge Connected



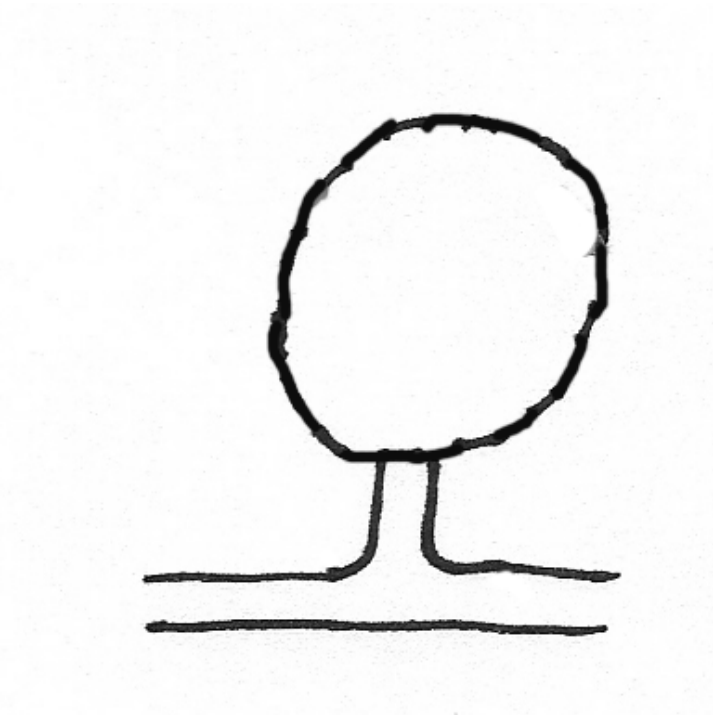
Why Isolated Substructures are Special



Moving Isolated Substructures



Tethers are Edge Connected

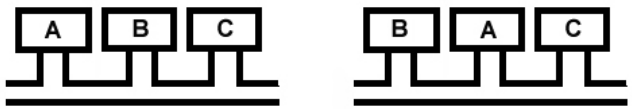


Distance Functions

- There are several possible distance functions on Braided Ribbon Networks
- The standard distance function of graph theory is one of the most basic to consider
- The induced graph topology does not take into account any braiding
- More complicated distance functions can be considered, but nearly all will allow a mapping onto the standard graph theory distance function

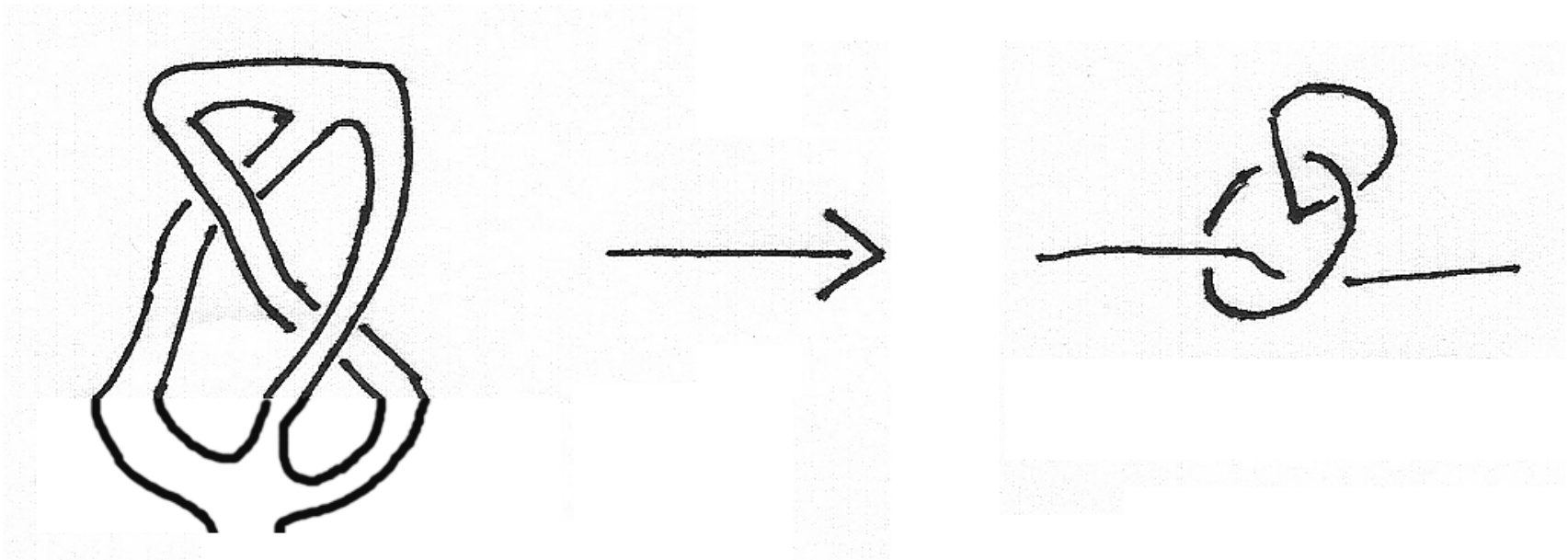
Translations

- Can move an isolated substructure to any edge connected edge segment
- Adjacent isolated substructures can therefore move past one another
- We therefore can get translations



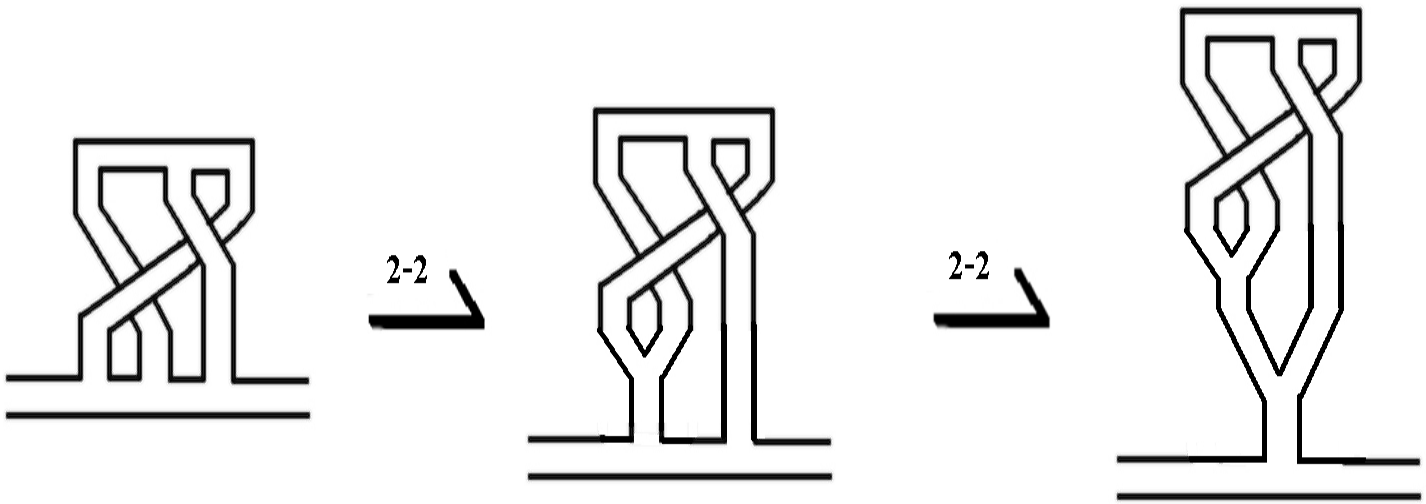
The Reduced Link of Isolated Substructures

- Reduced link of Isolated Substructures takes form of knotting and linking around a strand
- These reduced link components can ‘slide’ past each other



Interpreting Isolated Substructures

Most interesting things are ‘isolatable’



The Need for Another Move

- The reduced link invariants are ‘frozen’ under the evolution moves
- We therefore need additional moves if we want isolated substructures to be able to interact

Conclusion

- Isolated substructures show potential to be Sundance preons within Braided Ribbon Networks
- We have translations for these structures
- It remains to then find a second evolution algebra

Acknowledgements

- Perimeter Institute and the University of Waterloo for funding my trip to Morelia

Bonus: More Complicated Translations