

Footer Tagline

Stacks

In their 1979 book *Gödel, Escher, Bach: An Eternal Golden Braid*, Hofstadter and Dennett talk about stories in this way. It's another example of recursion: nested stories bracketed within stories. Hofstadter and Dennett understand such stories as *stacks*.

the terms *push*, *pop*, and *stack* all come from the visual image of cafeteria trays in a stack. There is usually some sort of spring underneath which tends to keep the topmost tray at a constant height, more or less. So when you push a tray onto the stack, it sinks a little-and when you remove a tray from the stack, the stack pops up a little• (136).

The customer can only ever take the top tray. Stacks are not unique to cafeterias. My browser software maintains a stack of interlinked websites I've visited. Hitting the return arrow button takes me back down the stack. The undo function on most text and image processing apps does something similar. A stack is a way for the software to keep track of a series of nested (recursive) computer events.



City stacks

The stack is also a useful metaphor for understanding the spatial organisation of cities. Builders stack elements on top of one another, e.g. bricks stored on a construction site. You can't get to the bricks at the bottom of the stack until the bricks above are removed. Though less mobile, urban layers are stacked and accreted on top of one another over time, even down to archaeological strata.

Such strata are not as neat as cafeteria trays. It's easy to undercut the order of a stack of bricks, or tunnel through the layers of a city as it is to circumvent the bracketed elements of a narrative, and leave them dangling (to mix metaphors).

Precise, algorithmic stacks are the way that computer programs manage navigation through recursive algorithms. A stack is a data table that keeps track of the stages in a recursive process.

Many programming platforms, such as Prolog and Lisp, use stack-like data structures to accommodate recursion, and hence provide the means of searching a problem space, such as the best route through the city, i.e. exploring a tree of decision points. See post: [Recursive cities](#).

Recursive cities, again

They don't mention *stacks*, but in their 2007 book chapter "Imagining the recursive city" Michael Batty and Andrew Hudson-Smith explained how we can think of the city in terms of recursive structures.

In cities for example, evidence of recursion might be seen in the physical patterns of its development where certain modules repeat themselves in different places, at different times, evidence enough of similar processes at work. But recursion may not show itself physically. The way populations in cities behave in space and time, the way individuals, groups, institutions organize their activities, the way economic and social functions determine modes of living and work can all show evidence of such patterning (39).

In so far as cities exhibit recursion, they also display characteristics of the stack. Stories are an essential part of our experience of the city, which takes me back to the start of this post – the stories people tell.

Excursion and return

Each nested plot event provides a context for the one nested within it, which in turn informs the events outside the brackets. That accords with the leitmotif of *excursion and return* popular in theories about play, tourism and interpretation.

Essential to play is the freedom of movement to and fro, back and forth, up and down the field – the repeated circular movement of **excursion and return** that is under control of neither the individual players nor referees but belongs to the playing of the game (104).

That's another link with the city: the city is recursive, meaning it's a place that invites *return* – through travel, narration, recollection and imagination. But the return is never a simple algorithmic return, as in a recursive algorithm. The traveller is transformed in the process, and the city is transformed, like the meanings accrued by nested parentheses in an interesting story or coherent speech. See post: [Oblivion](#).

References

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Note

- On stacks, also see post [Romancing the blockchain.](#)

Category

1. Architecture

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1. city
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