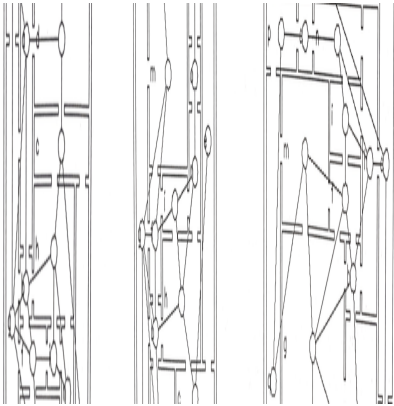




Eliminate the impossible

Description

“When you have eliminated the impossible, whatever remains, however improbable, must be the truth” said Sherlock Holmes, in *The Sign of Four*, ch. 6 (1889). One of the ways to eliminate the impossible is to first enumerate everything that can be enumerated – probable or not.

René Descartes said something similar. His last rule for sound reasoning “was to make such complete enumerations and such general reviews that I should be sure to have omitted nothing” (41).

Rectangular dissections

An event in Cambridge last month reminded me of the fascination with *possible* permutations. That was the [Memorial Conference in honour of Lionel March](#), a pioneer in mathematical methods applied to architecture and design, amongst other notable contributions. His 1971 book with Philip Steadman, *The Geometry of Environment*, and subsequent books and articles makes clear the value of enumeration, laying out all possibilities and permutations.

In their case this mainly involved floor plan layouts: enumerating all the possible ways that rooms can be laid out in a building: taking account of adjacencies and interconnections (doorways). In more abstract terms, this could be all the ways that a rectangle can be divided into a series of tightly packed smaller rectangles. Once all possibilities are enumerated, it’s then possible to count, classify, order and filter such arrangements, and derive their properties. It’s also something you can get computers to do.

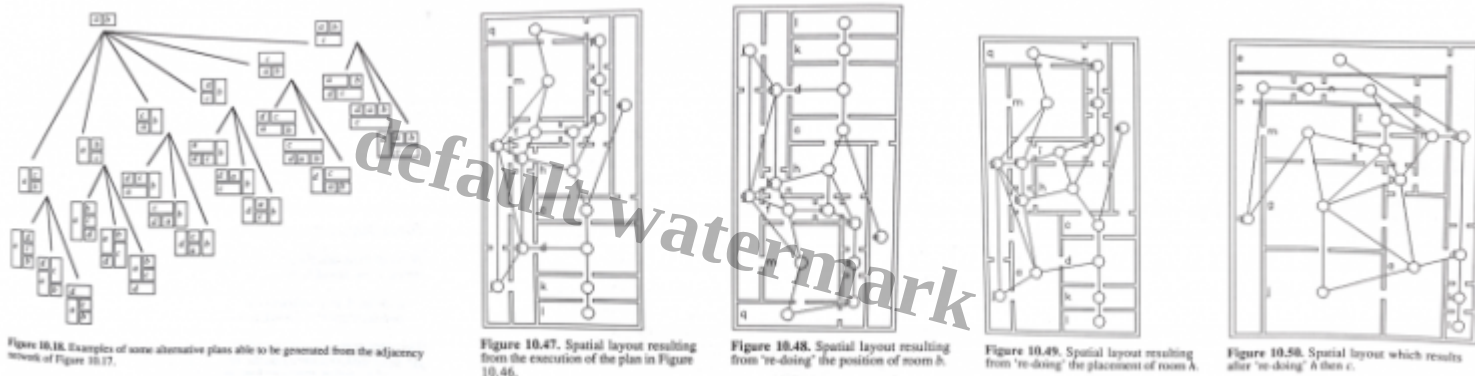
Then there’s the challenge of circumventing the impossible task of permuting very large numbers of elements (say, rectangular rooms). According to a paper on the topic, there are over 280,000 ways that 10 rooms can be arranged, without taking account of their dimensions. Beyond that, the number of possibilities becomes unwieldy to enumerate and process, and intelligent but inelegant methods are called for. See post: [What’s wrong with parametricism](#) for a discussion of the ubiquity of the so-called *combinatorial problem*.

Combinatorics

Iâ??ve been investigating combinations, locks, keys, encryptions, and codes in the context of the city, beyond discourses about big data, measuring, modelling, visualising, monitoring, and surveillance, in the so-called â??smart city.â?•

Under the sway of *The Geometry of Environment*, those of us with a computational bent were enthralled by the idea of enumerating all possible combinations of things, such as rooms in a floor plan, classifying them, filtering and selecting from all possible permutations. *The Geometry of Environment* incorporated the New Maths of the time and set-theory into thinking about architecture and space.

Hereâ??s evidence of my own forays into rectangular dissections, and an attempt to deal with large numbers of rooms that meet some kinds of relational constraints as I outlined in *Logic Models of Design*.



Towards a phenomenology of combinatorics

Considering the difficulties of such enumerations, and questions about their practical usefulness, one may well ask: whatâ??s the point of combinatorics in architecture? From a phenomenological (and psychological) point of view, I can speculate that enumeration meets several needs and desires.

- The first is the collectorâ??s mind set. People like to collect and classify, which in turn demonstrates a desire to have mastery over a domain of expertise. If you can enumerate then you can control. The history of scientific classification, encyclopedism, enumerations of architectural styles, mass production and other manifestations of the â??Will to Powerâ?• might cover this.
- Second is an anxiety of missing out on something. As Descartes said, he thought it necessary in his philosophical reflections to provide such complete enumerations so as to â??be sure to have omitted nothing.â?• Fear of missing out is a basic human anxiety. Itâ??s the elusive combination that drives the restless generation of yet more permutations, and the search for answers.
- One of the things we may fear missing is *the* crucial combination, the key to the safe as it were. Combinations provide a key to unlock something hidden. That takes me back to the relationship between permutations and riddles. See previous post on the [Riddle of the Sphinx](#).

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Date Created

April 20, 2019

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