On why we can not envision a tesseract: 'unfolding' the interior once more (reflections on three representational techniques for the design of the interior)

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Abstract

Narrowing in on the drawings made by the furniture maker Gillow and Co. (c.1806 - 1831), this text will examine the notion of hybridity as a tenable representational premise for the design of the interior within the digital age.

Stylistically, the link between Gillow and Co.'s work and current practices of interior representations exemplify an amalgamation of sorts. Where both showcases a multitude of drawing techniques harnessed to provide a synoptic impression of the interior in one drawing, as a point of departure, present-day interior projections—in particular, interior collages—emancipate both their mediums and representations in the process of hybridising drawing conventions and images as part of their design language.

This endeavour is a historiography of interior spatial representations that begins with the drawing of lines between interior decorators and upholsterers that occurred around the time of this 'curiosity' of a technique made its appearance (see Figure 2), to the rise of the professional interior designer and its reliance on the interior perspective render (see Figure 3), and of the practice's continued 'unfolding' under the praxis-practice of environmental design and its types of spatial experimentation (see Figure 5). This hybridity of conventions, images and of course, meanings have exposed latent possibilities that have become increasingly useful in the actual design of space in specific levels of scale—cutting across the spatial disciplines through this manner of either representation and lamination.

By rendering this history of interior spatial representation as a metaphor of the interior-as-box, this text ultimately aims at advancing how the interior collage as a means of representing the 'design idea' is reshaping how interior design notions echoes outwards to influence how other spatial designers conceptualise and design space today.

On why we can not envision a tesseract[1]: 'unfolding' the interior once more (reflections on three representational techniques for the design of the interior)

Figure 1: williamCromar, Unfolding a cube creates its net, a graphic, cruciform shape, 2013.[2]

The ways of representing the built environment today are more or less the same as it was when architecture was first conceived as a distinct practice during the

Renaissance[3]. Primarily driven by the audience they wish to engage, they can still be broadly categorised in the same way in the contemporary practice of interior design: conceptual, presentational, and technical.

It can be argued that we are at a period in history where we are no longer concerned with distinctions and that any mode of representing the design idea for the interior is as good as the other. However, in actual practice, this can never be farther still from reality as many interior design practitioners can still be seen generating ideas by way of the sketch (conceptual), clients still rely on interior perspective renders in order to visualise the outcomes (presentational), and builders still depend on orthographically drawn plans, elevations, etc. towards the realisation of interior design projects (technical).

Of course, with the continued advancement of technologies, we are seeing new ways of communicating the design idea for the interior[4].

For this text, we will look into one *presentational*[5] technique that can be said to be fitting of the technologies of today: the interior collage as a hybrid presentation drawing.

Ro Spankie in *Drawing out the Interior* would broadly define hybrid drawings as the "fusing of the different techniques [that] creates new methods of drawing for the interior" — and the interior collage belongs to this representational category in both its traditional (use of scissors and glue) and contemporary (use of image-editing softwares) sense.[6]

Certainly not a unique phenomenon, this will be the first question of two that this endeavour will concern itself with: of identifying whether there were precursors to the interior collage within the drawing traditions specific to the practice of interior design.

Flowing from this, the second question that will concern us here will be similarly framed as the proposition posited by Robin Evans in "The Developed Surface: An Enquiry into the Brief Life of an Eighteenth-Century Drawing Technique" and Laura Jacobus In "On 'Whether a Man Could See before Him and behind Him Both at Once': The Role of Drawing in the Design of Interior Space in England c. 1600-1800": that in as much as the developed surface interior[7] as a hybrid presentational technique can be said to be an example for the exchange between "things visual and things social"[8], could the same be said of the interior collage of the present-day?

This is a big proposition indeed, and on top of this, unlike both authors who benefitted from looking at interior representations made in the past, this endeavour will look into drawings being generated contemporaneously.

With this in mind, in surmising what role interior collages play in the process of designing interiors today, this text takes on a more explorative approach. In the end, more questions may arise than originally thought—which is perhaps best as we still grapple with the speed these technologies are changing and how this, in turn, is challenging long-held drawing traditions in the practice of interior design.

Lastly, in the framing of this text as a chapter in the continuing narrative of the unfolding of the profession under the rubric of environmental design[9], this text intends to forward the relevance (still) of a historiographical approach as a form of design research in its positing of the interrelatedness of historically specific texts—

and drawings—of Evans and Jacobus to current practices of representation in order to arrive at the question of what role does the drawing have in the spatial practices of today.

The drawings made by the furniture maker Gillow and Co. (c. 1806 - 1831) can be argued to be the first presentational hybrid drawings produced by a company *specifically* working on interiors. Meant to illustrate how furniture produced by the company are to be located in a room—and made primarily for the benefit of clients—these drawings are hybrids in the way they combined the developed surface interior with furniture drawn in perspective (see Figure 2).

Although for Robin Evans in "The Developed Surface: An Enquiry into the Brief Life of an Eighteenth-Century Drawing Technique", these drawings by the company were actually the harbinger of the demise of the developed surface interior technique: that instead of arriving at a clear representation of the design for the interior in one drawing, it ended with a more confounding one[10]. In spite of this, it would be interesting to hypothesise—and we can only speculate why indeed these drawings were produced this way—how:

1) simply, the draughtsperson could have intended the drawing to be capable of economically relaying information to all concerned all at once—economical as this is above all, a business;
2) more intriguingly, given the developed surface interior's prevalence in the last two centuries of working on the interior[11], by the turn of the century, they're simply considered *de rigueur,* and the addition of the furniture in perspective is but a stylistic flair added by the company.

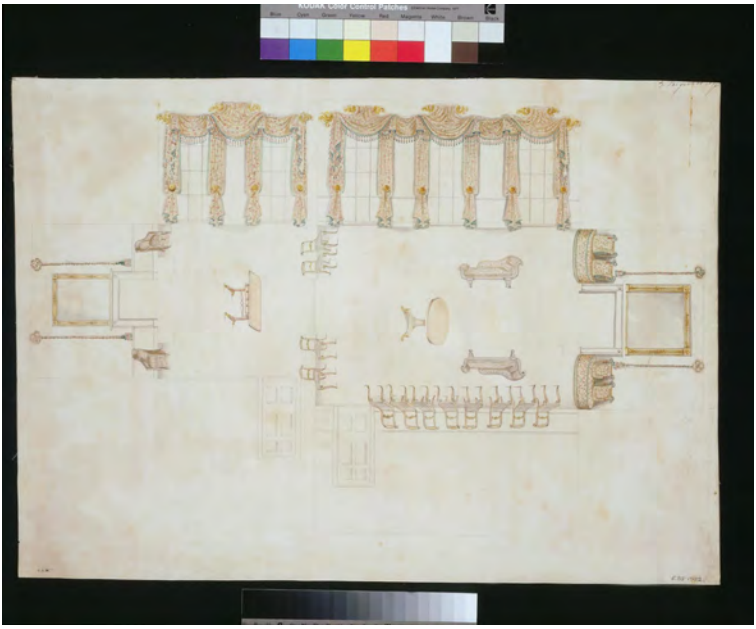


Figure 2: Gillow & Co., Design, from a set of 94, for furniture and interiors, made in the studio of Gillow & Co., London, 1806-1831. Drawing in pen and ink, and watercolour.[12]

The first point is certainly important considering that with one drawing, all 'audiences' are indeed engaged: the client, as noted, to show how a piece of furniture they intend to buy relates to the interior, fellow designers to showcase the interior in its totality and even builders themselves[13] with the developed surface interior's orthographically-correct drawing of the plan and elevations.

In fact, this is consistent with the visual presentation of the developed surface interior that works along the line of thought of opening up the interior as if a box (see Figure 1); where all the elements that make up the interior can be taken in at one go.[14]

Unfortunately, no such economical drawing—one that can simultaneously communicate with everyone involved in the designing of the interior—can truly exist.

The second point—the stylistic addition of furniture in perspective—can be easily dismissed as a reflection of the owner's, designer's, or even the draughtsperson's mere preference.

But Evans' insistence of this being the source of confusion in the whole drawing brings us to question his argument for drawings in general as something more than just a neutral 'conveyor of an idea'[15]. Further, as Evans himself explicated, the developed surface interior drawing made manifest how 'things visual and things social' interacted. Within this frame, this 'curiosity' of a technique can not be reduced to just a simple matter of taste. For Evans, the enveloping space of the interior was better represented using the developed surface interior technique at the

time when the interior spatial configuration of the houses in England slowly evolved from the traditional hierarchal, user-centred layout to a layout that emphasised how rooms are used in themselves. When it used to be that uniformity of the way rooms are designed was the rule, the shift of focus to how they function meant that variance between rooms now took precedence. Herein lies the power of the drawing: the hermetic developed surface interior technique made it possible to *think of* rooms by themselves[16] that goes beyond the idea of the drawing as a mere tool for presentation. Evans would continue and point how this change in the layout of houses was also made manifest in how furniture in each room is arranged. From a heliocentric arrangement of chairs—as if the host was the sun and around her was the circle of chairs that reverted back to be positioned against the walls when a room is not in use[17] and hence drawn in the elevations as if they were attached to the interior walls—the 18th century witnessed a similar liberation from such a restrictive social hierarchy within rooms.

And this is what interests us here, this idea of a break from tradition as made visually manifest in the drawings of Gillow and Co.

From this vantage, these 'confusing' drawings produced by Gillow and Co. did not only afford the viewer a synoptic drawing of the interior, but with the introduction of pieces of furniture drawn in perspective, it actually introduced a novel way of situating interior objects that unlike other elements of the interior, are now free to move about.

What Evans failed to acknowledge here is the idea that these drawings are not 'confusing' because of the interjection of movable furniture in perspective per se. What made them confusing is found in their betrayal of the draughtsperson's inability to communicate this *new* interior.

These drawings by the company exposed the limitations of such a technique that in turn showed the draughtsperson literally struggling on paper with the drawing.

Such a technique so obsessed with the fixed planes of the interior (i.e., floor and walls) made it simply impossible to account for things that have all of a sudden become mobile (i.e., furniture).

Laura Jacobus in "On 'Whether a Man Could See before Him and behind Him Both at Once': The Role of Drawing in the Design of Interior Space in England c. 1600-1800" also made explicit the connection between 'things visual and things social' by way of other drawings for the interior that also made use of the developed surface interior technique.

Given the limitations of any drawing technique, Jacobus emphasised the workarounds spatial practitioners made in order to present the design idea. Like Evans, Jacobus understood the drawing to be a determining force in the design process directly influencing how the designer conceives space[18].

From Evans' 'things visual and things social,' Jacobus, however, would transition to 'things visual and things of the mind' and argue for how the drawing is like a map to the designer's way of thinking about space[19]. The author used William Kent's drawing of the Queen's Library at St. James' Palace as a demonstration of this—"thinking aloud on paper"[20]—as the decorator struggled to represent what he had in mind, pulled apart by the opposing forces of the strict geometry of orthography and the physical dimensions of the actual space.

As noted, the draughtsperson responsible for the Gillow and Co.'s drawings struggled similarly, but instead of being pulled apart by the limits of the technique and actual space as in the case of Kent[21], it was the developed surface interior that was being stretched by the possibility of movement within the space.

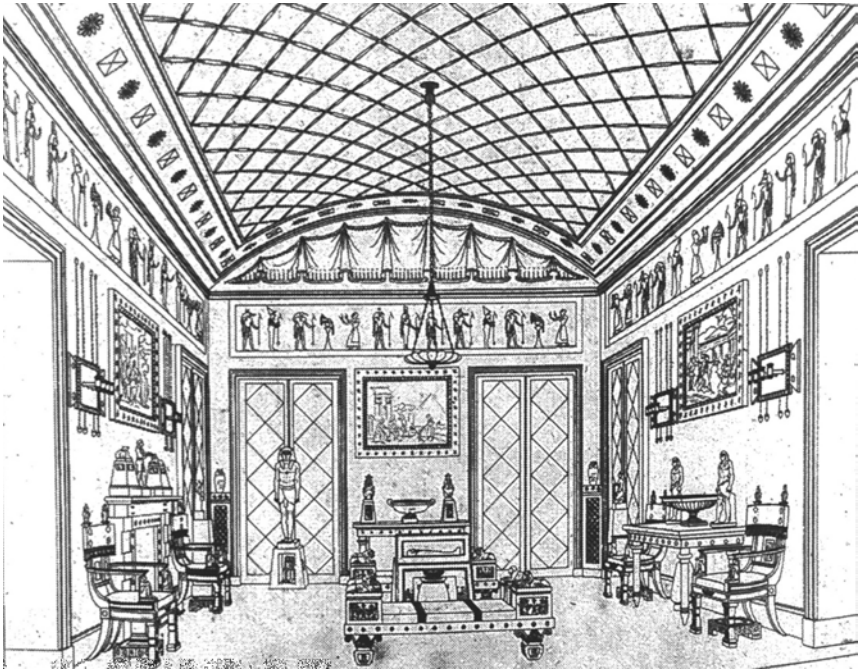


Figure 3: Thomas Hope, The Egyptian Room in the Duchess Street Mansion in Household Furniture and Interior Decoration, 1807.[22]

The rise in the popularity of the use of the interior perspective render in the 19th century in the practice of interior design can be boldly attributed to this idea of the inability of the Gillow and Co.'s drawings to affix the otherwise mobile elements of this interior.

It was around the same time as when these drawing by the company were produced that perspective drawing can be said to be endorsed in the practice of interior decoration by way of its use by one of the practice's most prominent figure: Thomas Hope (see Figure 3).

Not that perspective has not been used prior: it forms part of the architect's repertoire of drawings ever since the Renaissance after all—even if it was relegated to a less important role when compared to orthographically produced drawings[23] [24].

Before this revival of sorts, perspective drawing was employed in the production of interior-portraits[25] and as a tool for documenting the details for old buildings[26]. However, in its 19th-century reiteration in the practice of interior decoration, it became the most effective tool in the interior decorator's repertoire of drawings—generative in the sense that it came before the fact of building as a presentation drawing.

The anthropocentric point of view this drawing technique afforded meant that interior representations became more, to an extent, humanised in its presentation of the interior; as

if one is actually standing inside the space thus providing a sense of bearing relative to the other elements of the proposed interior.

Further, and of particular interest for us here, perspective drawing is not bound to the strict geometry of orthography.

The language of perspective necessitates none of the rules that made the drawings of Gillow and Co. 'confusing' because ultimately the definition for such is only bound to that which it relates to—which in this case is the orthographic geometry of the developed surface interior.
In perspective's privileging of the singular 'look' of the interior—that literally is prefigured by the point of view—the interior perspective render is able to secure all the elements of the interior in one drawing.

The fixity it afforded clients as a presentation drawing made it succeed where the room-as-a-flattened-box that is the developed surface interior, in its inability to pin down otherwise ambulant pieces of furniture, failed.

Where the Gillow and Co.'s drawings struggled to reign in the furniture, the interior perspective render in its centring of all interior elements to that vanishing point made sure the necessity for the traditional triumvirate of conceptual, presentational, and technical drawings well into the 21st century.

The tesseract (see Figure 4) represents another dimension beyond the purview of the first two representational techniques discussed so far: time. Ironic indeed since the discussions so far have, in fact, revolved around the idea of temporality: of the fixity of representational techniques vis-à-vis mobility of interior elements in the case of the developed surface interior and the fixity of the point of view—and concomitant 'freezing'[27] of such a view for posterity—in the case of the interior perspective render.

To an extent, herein lies the objective of the interior collage: that precisely in its disregard for the technicality that governs both orthographic and perspective drawings, it is able to introduce the element of time.

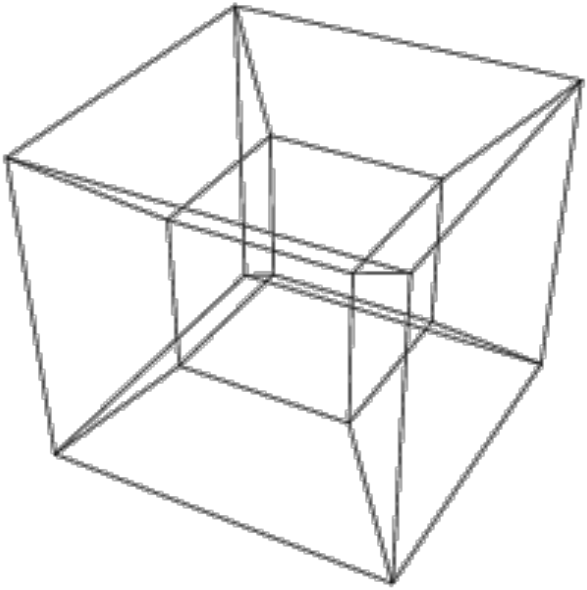


Figure 4: Eric W. Weinstein, Tesseract.[28]

The drawing by Doris Hung Shuk Ying entitled “The Adventurous Room,” (see Figure 5) is a particularly interesting example of such an interior collage. Stylistically operating in the same way as the developed surface interior technique in its flattening of the walls of a box outward, their similarity ends there.

At the most basic, this drawing is in fact representations not of interiors but—by way of contraction—of cities in Italo Calvino’s 1974 novel *The Invisible City*[29]. Following a process of translating written text into spatial terms, the premise of the project questions how the description of spaces, materialises from text into space as a consequence of hybridising representations and descriptions. The thesis questions the validity of drawing itself. Beyond that, it is through the mechanisation of the developed surface interior, as facilitator of spatial meaning and context, that the actual descriptions are made in their spatial specificity.

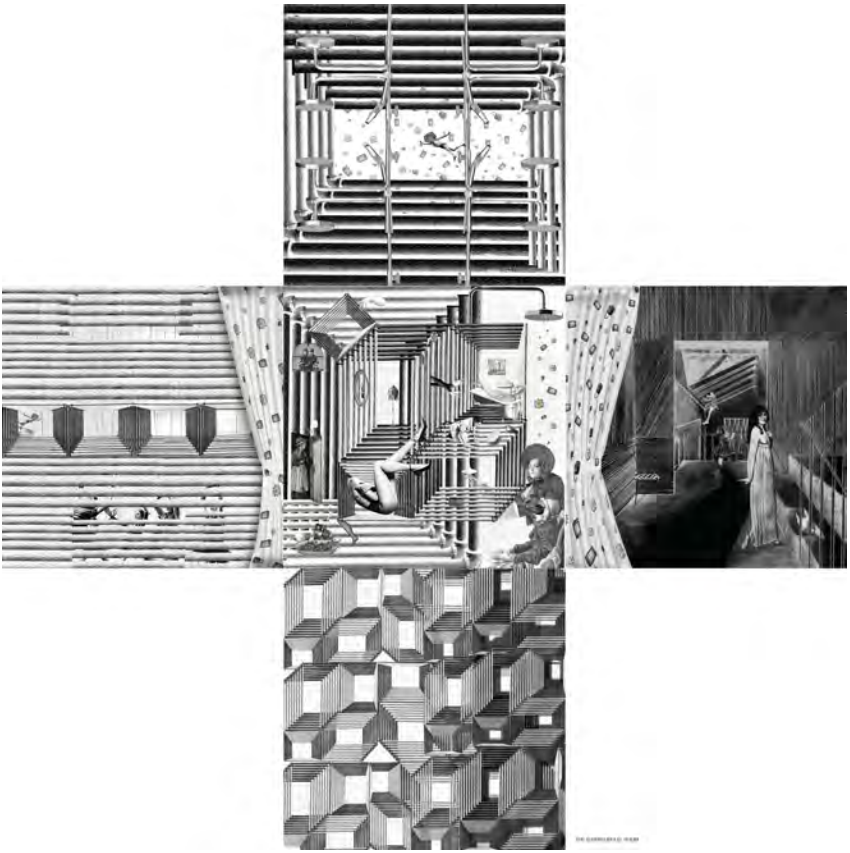


Figure 5: Doris Hung Shuk Ying, The Adventurous Room, 2017.[30]

Harnessing Jacques Derrida's philosophical work Of Grammatology and its inversion of language rules as an example, Hung limits her focus to the novel which was originally penned in Italian and later translated into both English and Chinese.[31] Each line of the four individual spatial descriptions is first visualised, collapsing elements, drawing mediums as well as perspective angles into one whole. Thereafter the various elements are mathematically examined in terms of its layout, graphically linking text with images and eventually space. Interior space in this sense, is reframed through language terminology as 'eloquence,' 'spacing,' 'word choices,' 'oxymoron,' 'parables' and 'analogies.'

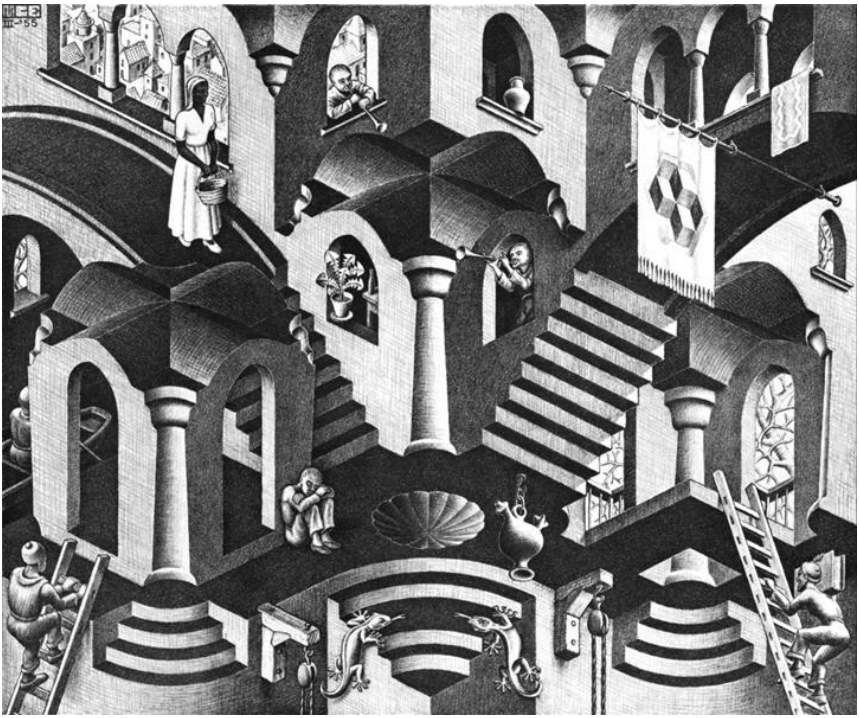


Figure 6: M.C. Escher, Convex and Concave, 1955.[32]

As a consequence, the operative medium is a collage: an assemblage made up of fragments of text and language. For example, where the English text refers to the characteristic of being "thin," describing pipes as the predominant structure of the city, the Chinese version harnesses the idea of thin nets suspended over the city to explain the delicate landscape. The final hybrid translation occurs when images of elements are substituted back into the original text for words. Each newly formed text-image tests the material qualities of text to space. Nowhere near *presentational* with its complex, Escherian logic (see Figure 6), objects or ideas that are supposed to be drawn to access their meaning are offset against their textual descriptions, which by default employ the linguistic characteristics of alphabetic or phonetic characters to convey meaning through an unfolding of images in both space in time and spatial experience.

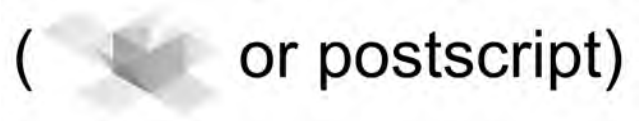
In spite of this, in the same manner that the Gillow and Co.'s drawings can be argued as examples of a decorator thinking aloud on paper, this example of an interior collage by Doris Hung Shuk Ying is similarly of this genre with its attempts at putting on paper ideas that are similarly convoluted.

In this mode of representing spatial ideas—in the stretching of the representations of space and time—we see a break from tradition.

Although the developed surface interior and the interior perspective render have helped in the circumscription of the interior design profession—at the turn of the 19th and 20th century by way of the professionalisation of the interior decorator and the interior designer respectively— the interior collage as a mode of representation is now at the forefront of *presentational* practices that go beyond customary ways of representing the design idea.

In as much as the drawings of Gillow and co. can be considered an attempt at breaking with representational traditions—intentionally or otherwise—the interior collage of today can be argued to signal the desire to do away with the restrictive rules of perspective drawing and its privileging of the centralising vanishing point directed by the human eye. In effect, this also entails the desire to do away with the reality that has been conditioned by this Renaissance point of view.

As axonometry was championed at the beginning of the 20th century as an alternative to perspective drawing[33], we are now once again at a similar juncture in the history of representing spaces. However, unlike these Modernists that were limited to the bounds of the paper, the virtual surfaces afforded by tablets, mobile devices, computers is a leverage that today's practitioners are enjoined to exploit.



Let us briefly return to the inspiration behind the title of this text[34]—or rather to an answer offered by rschwieb on why indeed we can not envision a tesseract:

> Big surprise: our brains evolved in a three-dimensional environment, and so that is what they are best suited for thinking about. It's easy to visualize because *we literally see it all the time*.
>
> Thinking in higher dimensions is harder because we have no (little?) direct experience with them, so there is not a clear prototype for most people to use as a springboard for visualizing it.[35]

So if ever the interior collage—similar to that of Doris Hung Shuk Ying's—as a *presentational* drawing may be hard to visualise to serve any purpose in the practice of interior design, let us take comfort in that 'curiosity' of a story by Edwin Abbot that came out in 1884: *Flatland: A Romance of Many Dimensions* (see Figure 7).[36]

In the same way that the two-dimensional characters of this story had difficulty understanding the notion of three-dimensionality—so used were they to things in two dimensions of the world they inhabit—we are perhaps just similarly unable to comprehend representations that attempt to go beyond three-dimensionality. Simply, our inability in visualising the interior collage can be said to be beyond our purview.

And as the future will undoubtedly be dominated still by perspectival modes of looking at things—in the way augmented and virtual reality technologies are harnessing this dependence in the practice of interior design—the time will come

that the interior collage will be reduced to being just like the developed surface interior: as a curiosity of the technique that was the harbinger of the demise of itself, as artefacts that show yet another designer thinking aloud on paper.

Nonetheless, let the interior collage be this struggle representing the inability to illustrate not the freely moving furniture in the way the Gillow and co. did 200 years ago, but the intangibility of space itself that is slowly being dissolved not just in the figurative sense, but also in the literal sense as well.

This can be considered but fitting as the profession of interior design is at the centre of the continued dissolution of traditional spatial *specialisations* under the spatially-encompassing practice of environmental design—given that this phenomenon of an 'unfolding' still holds true in countries where the practice is still traditionally contained within the notion of the interior-as-box[37] despite the fact that this shift was initiated around half a century ago.[38]

From this perspective, the interior collage is not only but a mere tool of presentation but is actually the crux—in its kinetic unfolding as afforded by the technologies of this Fourth Industrial Revolution—from which we will conceive the future of spatial practices.

Figure 7: Cover illustration for Edwin Abbot's Flatland: A Romance of Many Dimensions, 1884.[39]

References

[1] The title for this work was inspired by a question posted on an online site dedicated to math (Math Stack Exchange) by Robottinosino in 2012 who wondered: “Why is it that I cannot imagine a tesseract?… Specifically: what is *missing* for me to be able to imagine a tesseract? Understanding? A different kind of brain, that processes information in a different way?”

Robottinosino. “Why is it that I cannot imagine a tesseract?” *Mathematics Stack Exchange*, (October 19, 2012). https://math.stackexchange.com/questions/216847/why-is-it-that-i-cannot-imagine-a-tesseract

Further, this text can be considered a response to Bruno Latour’s challenge in a 2008 keynote lecture delivered for the Design History Society entitled “A cautious Prometheus? A few steps toward a philosophy of design” to, in this sense, a *literal* ‘return to the drawing board’:

> Now here is the challenge: In its long history, design practice has done a marvellous job of inventing the practical skills for drawing objects, from architectural drawing, mechanic blueprints, scale models, prototyping etc. But what has always been missing from those marvellous drawings (designs in the literal sense) are an impression of the controversies and the many contradicting stake holders that are born within with these. In other words, *you* in design as well as *we* in science and technology studies may insist that objects are always assemblies, “gatherings” in Heidegger’s meaning of the word, or things and *Dinge*, and yet, four hundred years after the invention of perspective drawing, three hundred years after projective geometry, fifty years after the development of CAD computer screens, we are still utterly unable to draw together, to simulate, to materialize, to approximate, to fully model to scale, what a thing in all of its complexity, is…. So here is a question I wish to raise to designers: where are the visualization tools that allow the contradictory and controversial nature of matters of concern to be represented?… Why can the powerful visual vocabulary that has been devised in the past by generations of artists, engineers, designers, philosophers, artisans and activists for matters of fact, not be devised (I hesitate to say restyled) for matters of concern? pp.12-13.

Bruno Latour,"A Cautious Prometheus? A Few Steps Toward a Philosophy of Design." Keynote Lecture for *Networks of Design*, meeting of the Design History Society, Falmouth, Cornwall, 3rd September 2008.

[2] Image from CHAPTER 4 — Dimensional Visual Elements I by williamCromar, accessed May 14, 2018 http://newmediaabington.pbworks.com/w/page/67293527/CHAPTER%204%20—%20Visual%20Elements%20I%3A%20Point%2C%20Line%2C%20Plane.

[3] Cammy Brothers, “What Drawings Did In Renaissance Italy,” in *Companion to the History of Architecture vol.1*, edited by Harry Francis Mallgrave 104-135 (Hoboken, NJ: Wiley, 2017); Wolfgang Lotz, “The Rendering of the Interior in Architectural Drawings of the Renaissance,” in *Studies in Italian Renaissance Architecture* 1-65 (Cambridge, MA: MIT Press, 1977); Michael Snodin, “Representing Rooms: Plans and Other Drawings,” in *Imagined Interiors: Representing the Domestic Space since the Renaissance*, edited by Jeremy Aynsley and Charlotte Grant, 128-129 (London: V&A Publishing, 2006); Peter Thornton, *Authentic Décor: The Domestic Interior, 1620-1920*. (New York, NY: Viking, 1984).

[4] Although not specific to interiors:

Olivier Meystre, *Pictures of the Floating Microcosm: New Representations of Japanese Architecture,* translated by Deke Dusinberre (Zürich: Park Books AG, 2017)

is a good survey of professional works made in the last two decades by Japanese spatial practitioners that reinforces the diversity of ways of representing the design idea.

[5] By presentational we share the definition of:

Sonit Bafna “How Architectural Drawings Work — and What that Implies for the Role of Representation in Architecture” *The Journal of Architecture* 13 (5) (2008): 535-564

of what constitutes presentation drawings:

> drawings that are used by designers, clients or critics to discuss qualities of architectural projects… drawings of this kind function less as transparent descriptions of buildings to which the actual critical attention is directed, but rather call for a specific mode of attention to themselves as artefacts. p.535

This is Bafna's take on Robin Evans' problematique in:

Robin Evans, "Translations from Drawing to Building" in *Translations From Drawing to Building and Other Essays*, 153-193. (London: Architectural Association Publications, 1997)

wherein the latter began with the idea that unlike artists (painters, sculptors, etc.) that work on their objects directly, architects work with an intermediary that is the drawing.

[6] Ro Spankie, *Drawing out the Interior* (AVA Academia, 2009), 150.

[7] Although Jacobus would refer to such a presentation as the "laid-out interior":

> to describe drawings having certain basic features in common, namely, that they use an orthographic (i.e., non-perspectival) system of rendering to show all upright sides of an interior arranged radially on a single sheet of paper. p.148

it ties up with Evans' definition for such a technique:

> In descriptive geometry, folding out the adjacent surfaces of a three-dimensional body so that all its faces can be shown on a sheet of paper is called developing a surface… It became a way of turning architecture inside-out, so that internal rather than external elevations were shown. p.202

Michael Snodin in "Representing Rooms: Plans and Other Drawings" will, like Jacobus, refer to this drawing technique as the laid-out interior.

However, we will use the term developed surface interior here in order to be consistent with the use of the visual metaphor of the interior-as-box that drives the narrative of this text (see Figure 1).

Laura Jacobus, "On 'Whether a Man Could See before Him and behind Him Both at Once': The Role of Drawing in the Design of Interior Space in England c. 1600-1800." *Architectural History* 31 (1988): 148-165.

Robin Evans, "The Developed Surface: An Inquiry into the Brief Life of an Eighteenth-Century Drawing Technique," in *Translations From Drawing to Building and Other Essays*, 195-231. (London: Architectural Association Publications, 1997)

[8] Evans, "The Developed Surface", 196.

[9] Merwood-Salisbury in "Interior Design as Environmental Design" ascribed the beginnings of this shift to one of the more celebrated and influential school of interior design: "based on modernist ideas about the improvement of physical well-being for all and the betterment of social relations.", p.119.

Joanna Merwood-Salisbury, "Interior Design as Environmental Design: The Parsons Program in the 1960s," in *After Taste: Expanded Practice in Interior Design*, edited by Kent Kleinman, Joanna Merwood-Salisbury, and Lois Weinthal, 110-129. (New York, NY: Princeton Architectural Press, 2012).

[10] Evans, "The Developed Surface":

> they ended up conflating three distinct types of drawing in a vain attempt to illustrate the topography of the floor and the flatness of the walls in one summary representation. The old technique of folding the walls outward is trundled out unflinchingly to satisfy one part of the requirement. At the same time small-scaled perspectives of the disengaged chairs, couches, footstools, card- and dining-tables float in the maelstrom of conflicting imagined spaces, each piece contributing its own idiocentric and cock-eyed

> cone of vision. Orientation of the drawing is utterly impossible, directly adjacent objects being frequently upside-down or sideways in relation to each other. Add to this the constant flicker between the two-dimensional representation of the wall surface and floor plan, and the splayed three-dimensionality of the autistic perspective constructions, and the confusion is complete. pp.221-222

[11] Evans, "The Developed Surface"; Jacobus, "On 'Whether a Man Could See before Him".

[12] Image from Victoria and Albert Museum, United Kingdom, accessed May 14, 2018, http://collections.vam.ac.uk/item/O78203/design-for-furniture-gillow-co/

[13] This would constitute third-party suppliers that interior designers rely on such as curtain-makers, carpenters, wallpaper suppliers, etc.

[14] As Evans, in "The Developed Surface", would theorise of the process of drawing the developed surface interior: "Drapes, furnishings, fittings, wall coverings, plasterwork, floor and carpet all beg to be drawn." p.209.

[15] To use Evans' description of the metaphor for the drawing as a vehicle in his introduction to *Translations from Drawing to Building*.

[16] Further, Wienthal in her foreword to *Interiors Beyond Architecture* would consider this drawing technique to be part of a 'distancing' of the practice from that of the practice of architecture in its literal depiction of interiors that does away with the "architectural framework" (ix) altogether.

Lois Weinthal, "Foreword" in *Interiors Beyond Architecture*, edited by Deborah Schneiderman and Amy Campos, vii-xii (London: Routledge, 2018).

[17] "When the room is empty the furniture reverts to the wall.": Evans, "The Developed Surface," 214.

[18] Evans would argue in the postscript to his essay that appeared in the book *Translations From Drawing to Building and Other Essays* that he meant the same with his statement: "(the drawing) makes it possible to see some things more clearly by suppressing other things: something gained, something lost" p.199. As noted, given the similarity of not only the subject matter, but even take on the matter, this postscript was meant to address the fact that his essay came out a year after Jacobus' text.

[19] "the sketch can be accepted as a record of the workings of the architect's mind": Jacobus, "On 'Whether a Man Could See before Him," 157.

[20] Jacobus, "On 'Whether a Man Could See before Him," 156.

[21] For Jacobus, the ultimate demise of the developed surface interior technique was brought about by the fact that once a room is no longer anything other than a rectangular or square box, then it simply would be near impossible to represent it using this technique.

[22] Image from Gere, *Nineteenth Century Interiors: An Album of Watercolors*.

[23] Brothers, "What Drawings Did In Renaissance Italy"; Lotz, "The Rendering of the Interior in Architectural Drawings of the Renaissance."

[24] That is if indeed, 'to sell' is less important in the building trade.

[25] See definitive scholarships on the matter:

Charlotte Gere, *Nineteenth Century Interiors: An Album of Watercolors*. (London: Thames and Hudson Ltd, 1992); Thornton, *Authentic Décor*; Mario Praz, *An Illustrated History of Interior Decoration: from Pompeii to Art Nouveau* (London: Thames and Hudson, 1981).

It should be noted though that these publications were subjected to criticism from scholars operating within the domain of interior design: editors Mark Taylor and Julieanna Preston in their introduction to *Intimus* would cast doubts on these publications as they "perpetuate the style-manual documentation of furnishings and accessories… [that] contributed to the suppression and relegation of the decorative to a lesser understood architectural activity" (p. 11). Also, in Penny Sparke's "The Modern Interior", the author noted how in relation to modernism, both Praz and Thornton have "adopted a highly elitist view. They showed little interest in the ideological impact on the interior of architectural and design modernism in the early twentieth century" p.10.

Penny Sparke, "The Modern Interior: A Space, a Place or a Matter of Taste?" *Interiors* 1 (1): 7-17; Mark Taylor and Julieanna Preston (editors), *Intimus: Interior Design Theory Reader* (Hoboken, NJ: Wiley, 2006)

Diametrically opposed to this, these works can be considered important as they afforded readers a glimpse of the lives of the people who occupied these spaces. That ultimately, the intimacy afforded by these portraits are more evocative of the times in which they were made as the three authors have asserted in their own way.

[26] Jacobus, “On ‘Whether a Man Could See before Him.”

[27] For Yve-Alain Bois in “Metamorphosis of Axonometry” this drawing technique represented Medusa’s death-stare.

Yve-Alain Bois, “Metamorphosis of Axonometry.” *Daidalos* 1 (1981): 41-58. http://arch.ttu.edu/w/images/e/e9/Bois,_Y.-A._Metamorphosis_of_Axonometry.pdf

[28] Image: Eric W. Weisstein, "Tesseract." *MathWorld - A Wolfram Web Resource*. http://mathworld.wolfram.com/Tesseract.html

[29] Gerhard Bruyns, “Interior Materialism[s],” *Artomity.* November 23, 2017. https://artomity.art/2017/11/23/interior-materialisms/

[30] Image from “Interior Materialism[s]” by Gerhard Bruyns in Artomity, accessed May 14, 2018, https://artomity.art/2017/11/23/interior-materialisms/

[31] Jacques Derrida, *Of Grammatology* (Baltimore, MD: John Hopkins University Press, 1976)

[32] Image from wikiart, accessed May 14, 2018, https://www.wikiart.org/en/m-c-escher/convex-and-concave

[33] Bois, “Metamorphosis”; El Lissitzky, “A. and Pangeometry,” (1925). https://thedetachedgaze.com/2014/03/15/105/

[34] See note number 1.

[35] rschwieb. “Why is it that I cannot imagine a tesseract?” *Mathematics Stack Exchange*, (October 19, 2012). https://math.stackexchange.com/questions/216847/why-is-it-that-i-cannot-imagine-a-tesseract

[36] Credit is due to user williamCromar who pointed to this story by Abbot and how it relates to our inability to visualise the tesseract.

Edwin Abbott, *Flatland: A Romance Of Many Dimensions*. (Project Gutenberg; NetLibrary, 2000). http://www.gutenberg.org/ebooks/201

williamCromar. “CHAPTER 4 — Visual Elements I: Point, Line, Plane.” *New Media Abbington*, (July 8, 2013). http://newmediaabington.pbworks.com/w/page/67293527/CHAPTER%204%20—%20Visual%20Elements%20I%3A%20Point%2C%20Line%2C%20Plane

[37] Such is the case in Philippines and Hong Kong where the authors are currently based as educators and practitioners.

[38] See Merwood-Salisbury “Interior Design as Environmental Design”.

[39] Image from CHAPTER 4 — Dimensional Visual Elements I by williamCromar, accessed May 14, 2018, http://newmediaabington.pbworks.com/w/page/67293527/CHAPTER%204%20—%20Visual%20Elements%20I%3A%20Point%2C%20Line%2C%20Plane