A research-by-design project set on the island of Hydra offers reflections on digital drawing as a tool to handle and negotiate ambiguity in the process of architectural design.

The Hydra drawings: digital imperfection

Claus Peder Pedersen

The Hydra drawings are the result of a research-by-design project involving architectural students. The drawings have been produced during intensive work sessions organised in March for the last four years on the Greek island of Hydra. The project has been run by architects Cort Ross Dinesen and Claus Peder Pedersen in close dialogue with contributors from other fields such as art history, literary criticism and philosophy: Henrik Oxvig, Fredrik Tygstrup, Steen Nepper Larsen and Malene Busk. The drawings that accompany the text published here were done by Tove Rosén, Emelie Saltas, Guro Sollid and Flemming Rafn Thomsen.

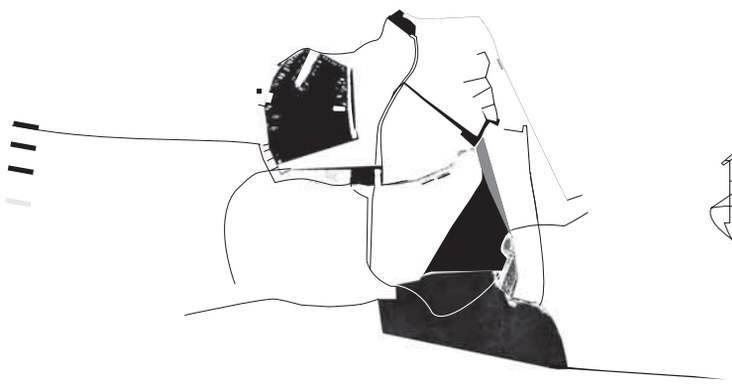
Mapping, thinking and drawing

The Hydra drawings attempt to explore dynamic morphologies through procedural exchanges between the representative and the autonomous drawing. The local setting of the island provides the starting point for the drawings. Hydra has a dramatic topography that creates a landscape of dynamic forces. These forces are clearly visible in the nature, farming methods, building typologies and infrastructures of the island. The initial drawings provide an intuitive mapping of this landscape of dynamic forces. However, the focus of the work is not mapping as such. Neither has it been concerned with traditional architectural surveying, nor with creating conventional architectural projects. The Hydra drawings seek to establish a dialogue between what might be called the mapped and the perceived, through reflections about architectural drawing conventions and ways of drawing. They are based on reflections about the process of architectural creation as a relation between medium and statement. It might be claimed that architecture since the Renaissance works with a distance between artist and statement, which differs from other art forms. The complexity of the architectural statement and the division between designer and builder make it necessary to interject a medium – typically the drawing – as an intermediary. This medium is not, however, a transparent representation of the ideas of the architect. The drawing is not an objective tool that merely formalises the ideas of the architect allowing them to be translated into space as buildings.[1] The production of the medium itself plays a role in what can be imagined. The tools and geometries delimit and open up possibilities to the architect.

British architect and historian Robin Evans discusses these questions in his book *The Projective Cast.*[2] Evans shows that geometry is inevitable in the creation and appropriation of architecture, but he does not link this inevitability to universal organising charts. Geometry emerges and is developed in the interchange between thinking and drawing, between drawing and building, between perception and thinking. In other words, Evans is not primarily preoccupied with the metaphysical meaning of geometry, but rather with a pragmatic investigation of the relation between geometry, representation, architectural perception and space. He thinks and draws across historical distances using Piero della Francesca's perspective, Philibert de l'Orme's stereometry, and Le Corbusier and Xenakis' ruled surfaces.

The appearance of the computer as a mainstream design tool during the last decade of the twentieth century challenges the intimate interchange between representation and geometry described by Evans. The calculation power of the computer in many ways trivialises the command of drawing's geometry to a point where the drawing loses its utility as a tool. It becomes possible to translate data directly into form and space through the digital tools shifting the focus from the geometrically manipulated drawing to programming and arranging data and relations. This is, for instance, the case with the 'Datascapes' of the Dutch office MVRDV. Their 'Datascapes' are virtual landscapes of economic and bureaucratic rules that determine what can be actualised as physical architecture. MVRDV uses digital models based on statistic data to extract surprising architectural designs of this landscape. Other architects like Greg Lynn and Bernard Cache use digital tools to determine the architectural statement through algorithms that convert complex contextual relations and influences into architectural form. With the advent of

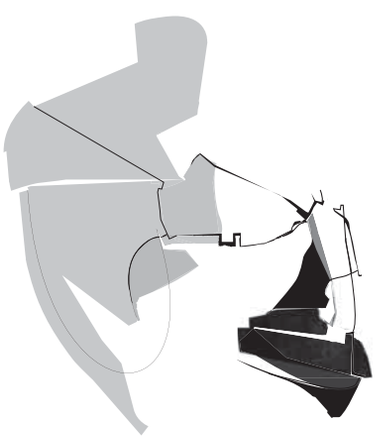
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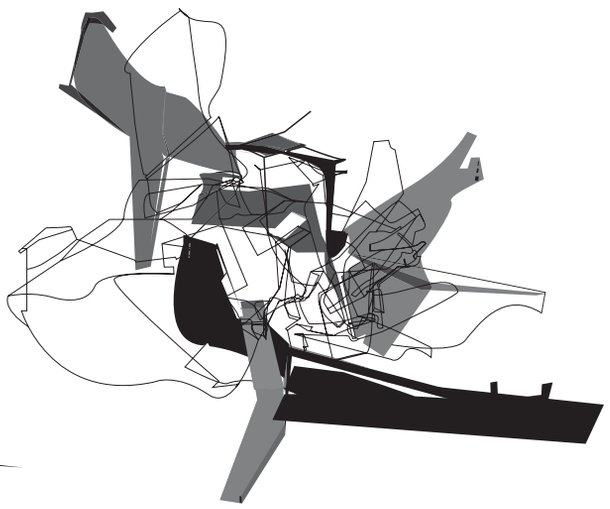
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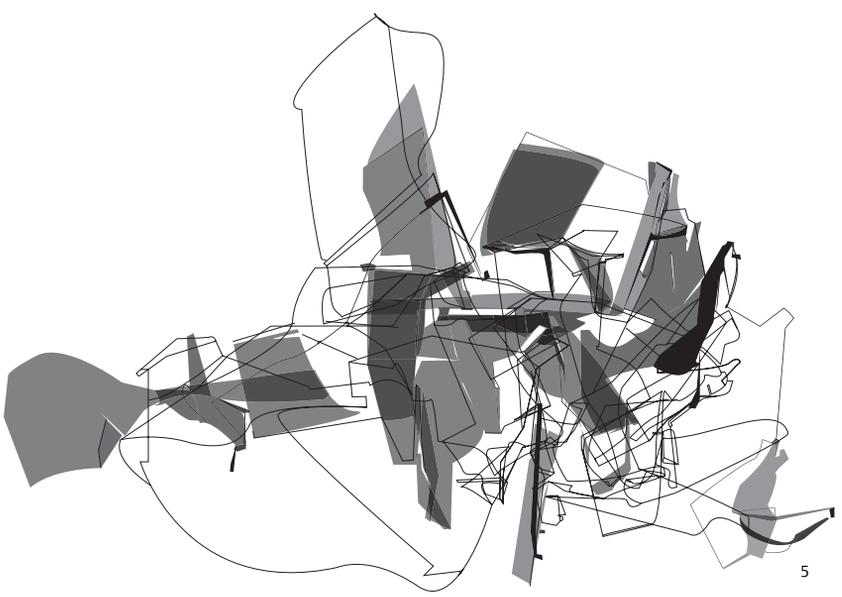
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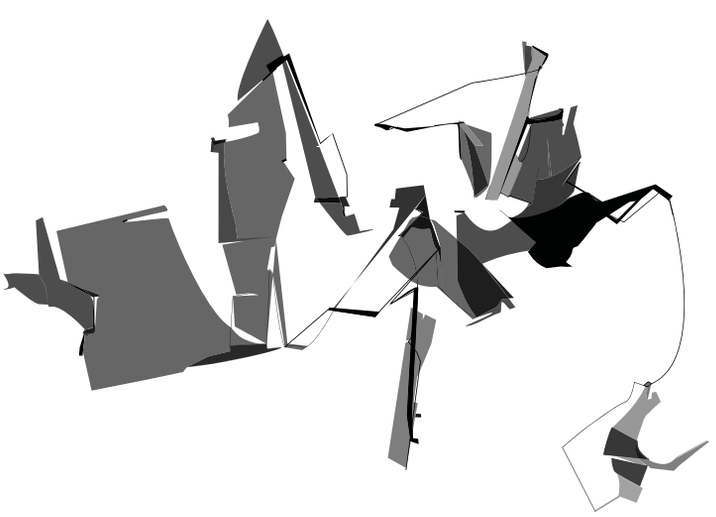
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1 **Emelie Saltas**
06.03.2007.
An early drawing that is based on an underlying map

2 07.03.2007. The drawing is developed towards a more unified and coherent appearance. Cartographic fragments are still visible

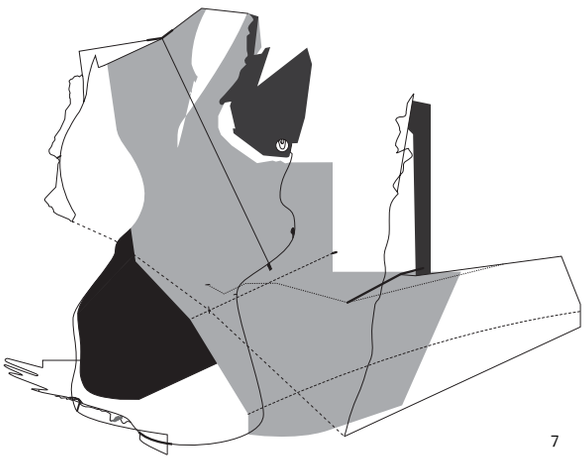
3 08.03.2007. The drawing is developed towards greater autonomy and cartographic references are disappearing

4 22.03.2007.
Elements of earlier drawings are repositioned into a new composition on top of a common matrix of lines

5 23.03.2007.
The drawing is developed towards greater complexity and aligned in accordance with the underlying matrix

6 28.03.2007.
The final drawing – the matrix has disappeared

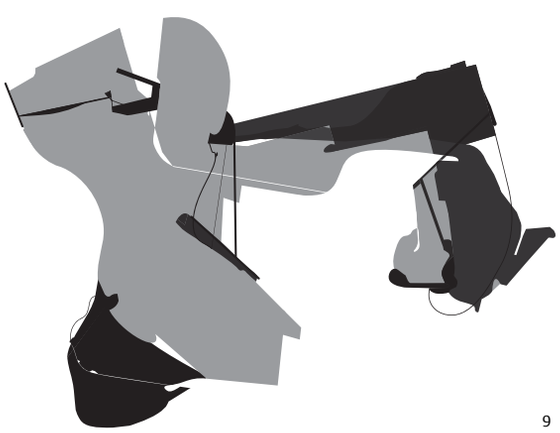
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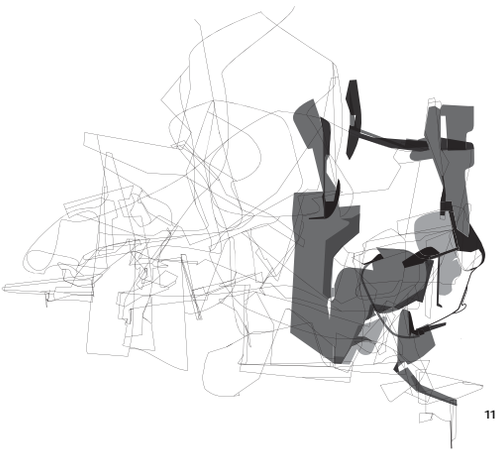
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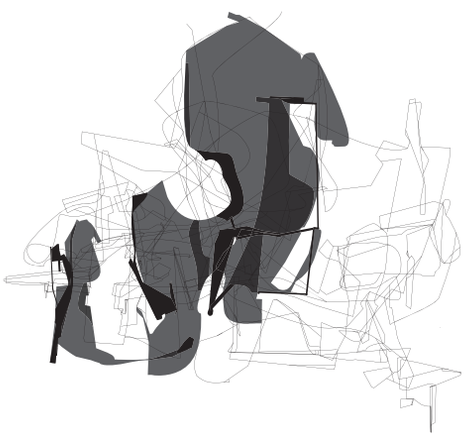
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7 **Flemming Rafn Thomsen** 05.03.2007. First drawing that has barely visible cartographic references

8 07.03.2007. The drawing is simplified and lines and elements are formalised

9 08.03.2007. The drawing is developed towards a more tectonic and constructed appearance

10 12.03.2007. The constructive elements are downplayed and the formal appearance of the drawing is more fluid

11 22.03.2007. Elements of earlier drawings are repositioned into a new composition on top of a common matrix of lines

12 22.03.2007. Elements of earlier drawings are repositioned into a new composition on top of a common matrix of lines – alternative version

13 23.03.2007. The drawing is developed towards greater complexity

14 28.03.2007. The final drawing – the matrix has disappeared

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15 **Guro Sollid**
06.03.2007. An early drawing displays a fragile static balance

16 **07.03.2007. The elements of the previous drawing are developed and repositioned in a horizontal composition**

17 **08.03.2007. The drawing is developed into two alternative static positions – an open and a closed**

18 **12.03.2007. The closed version of the previous drawing if developed and refined further**

19 **21.03.2007. Elements of earlier drawings are repositioned into a new composition on top of a common matrix of lines**

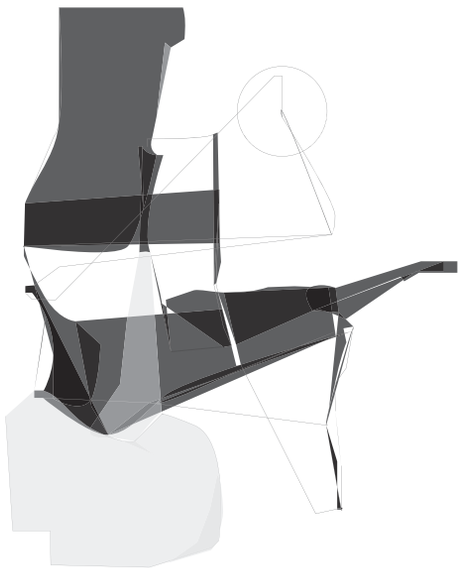
20 **22.03.2007. Elements of earlier drawings are repositioned into a new composition on top of a common matrix of lines – alternative version**

21 **22.03.2007. The drawing is developed towards greater complexity and aligned in accordance with the underlying matrix**

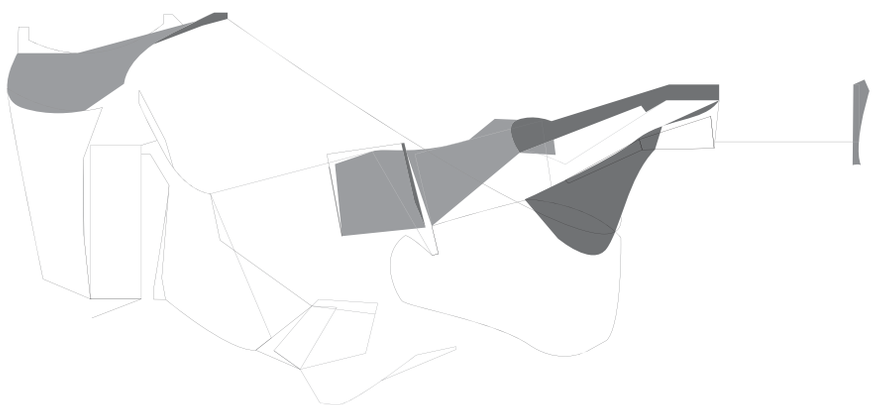
22 **23.03.2007. The drawing is developed towards greater complexity and aligned in accordance with the underlying matrix – alternative version**

23 **26.03.2007. The drawing is developed towards a new composition by combining the two previous drawings. The underlying matrix is gradually disappearing**

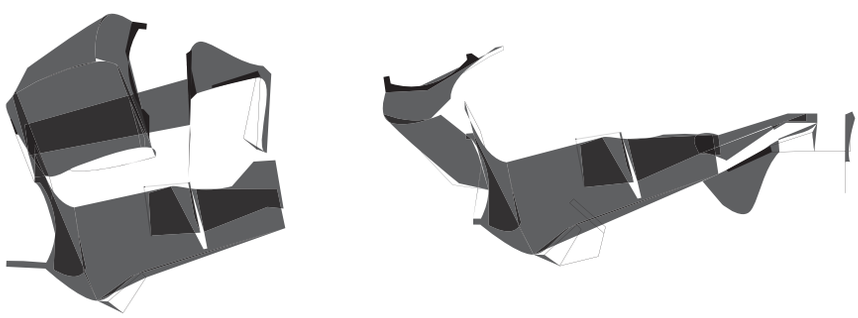
24 **28.03.2007. The final drawing – the matrix has disappeared**



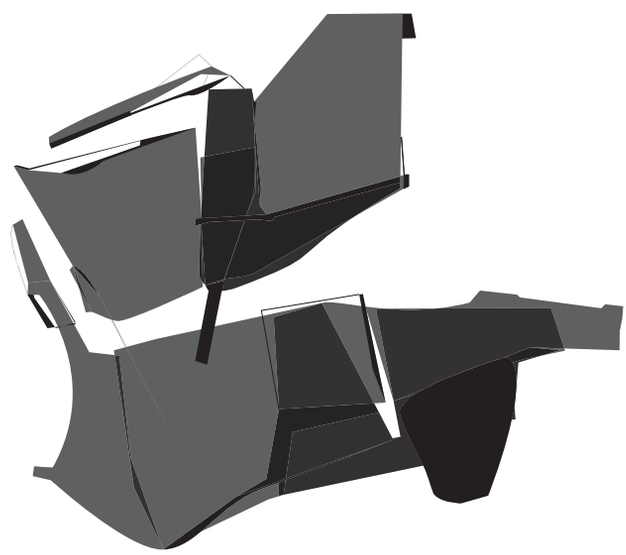
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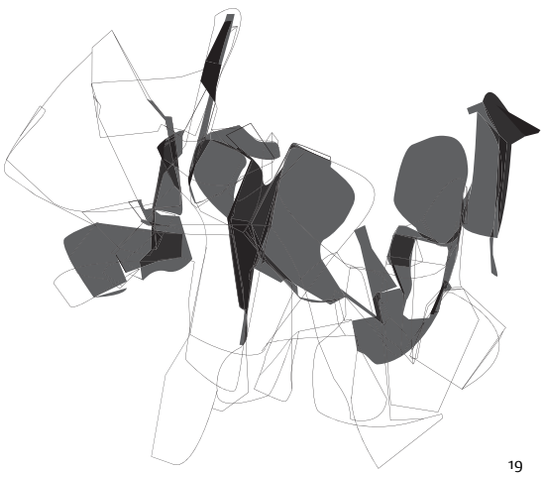


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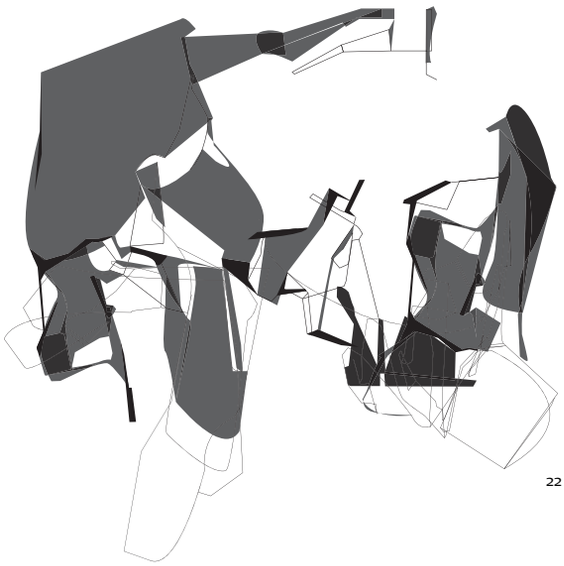


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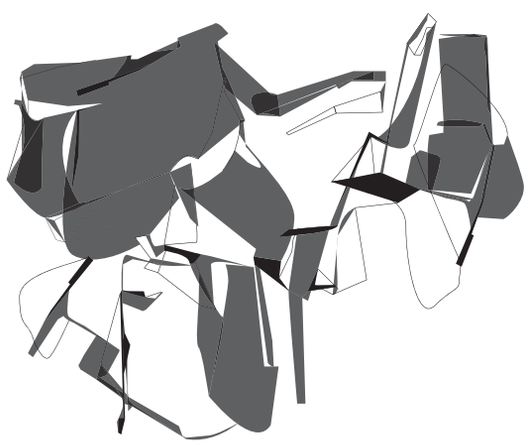
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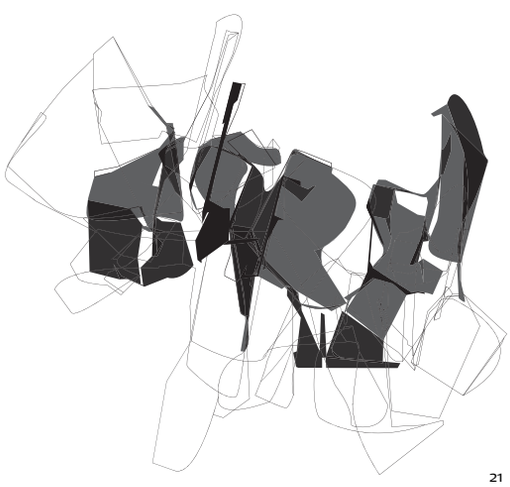
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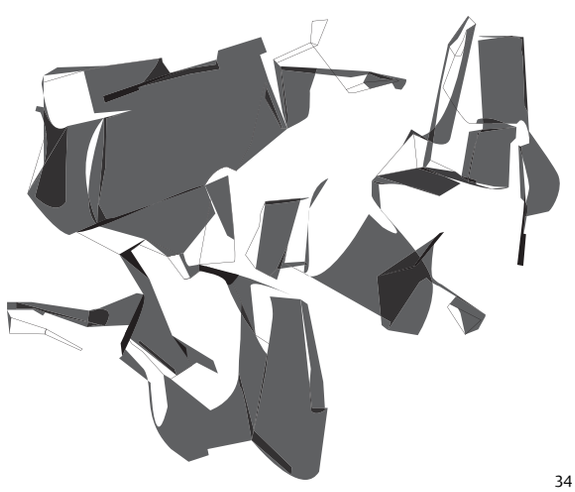
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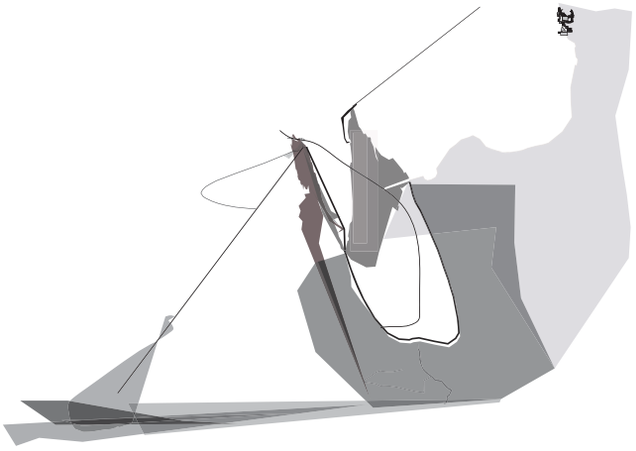


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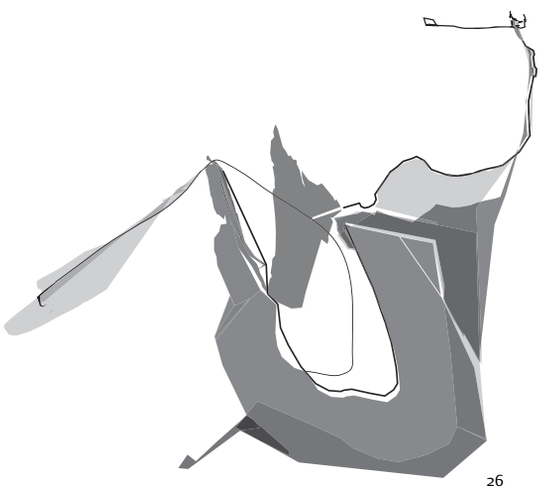
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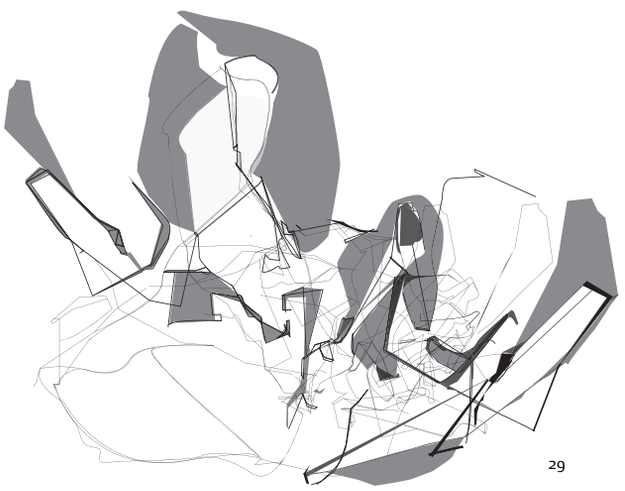
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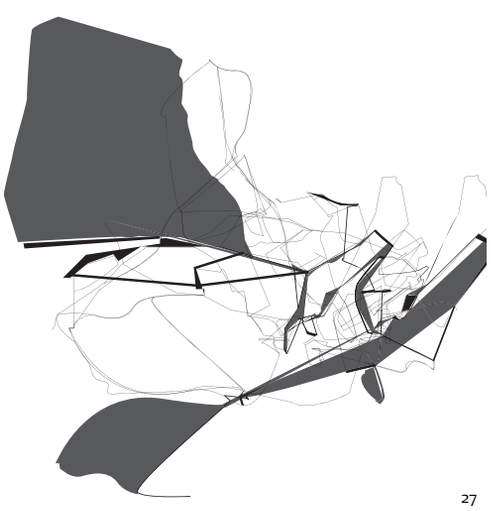
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25 **Tove Rosén** 08.03.2007. An early drawing that is based on cartographic elements

26 12.03.2007. The drawing is slowly developed towards a more coherent appearance. Cartographic fragments are still visible

27 21.03.2007. Elements of earlier drawings are repositioned into a new composition on top of a common matrix of lines

28 22.03.2007. Elements of earlier drawings are repositioned into a new composition on top of a common matrix of lines – alternative version

29 26.03.2007. The drawing is developed towards greater complexity by combining the two previous drawings

30 28.03.2007. The final drawing – the matrix has disappeared15 Guro Sollid 06.03.2007. An early drawing displays a fragile static balance

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parametrically based software such as 'Generative Components', this development seems about to enter into mainstream design and makes it likely that Evans' relation between 'thinking and drawing' eventually will turn into or at least be supplemented by relations between 'thinking and scripting' or 'thinking and programming'.

Digital imperfection

This situation poses interesting questions and opens up new possibilities in architectural design. The Hydra drawings try to address the challenges that digital tools present to architectural design in another way. They are more in line with the thinking presented by Stan Allen in 'The Digital Complex'.[3] In this text he pleads the case for a less technology-fixated rethinking of the architectural potentials of digital media. He indicates that the development of digital tools in the late 1980s and early 1990s led to a technological fetishism based on advanced animation software and a formal fascination with the complex, plastic form-world which these tools made possible. Allen claims that, as the computer becomes common property, it will no longer be possible to maintain the same fetishist relation to digital tools. According to Allen, other innovative, low-tech approaches to the medium will arise instead. One of his prime examples of such an approach is Richard Linklater's film *Waking Life*. It uses digital rotoscoping to create a hybrid between live acting and animation. The resulting movie does not look technically advanced but uses digital tools to twist familiar forms of expression with striking results.

The Hydra drawings result from the architect's analogous low-tech approach to digital tools (without adopting Allen's diagrammatic and pragmatic architectural project). The Hydra drawings implicitly seek to rethink the questions and challenges that the computer presents to the architectural drawing in order to develop a distinctive drawing logic related to the computer; a logic in which the significance of the drawing is not based on a formalised spatial representation of data but rather on the specific possibilities that emerge from the data handling and the interface of the computer. This approach is based on the idea that it is possible to consider this potential backwards – through a reflection on the differences between drawing with conventional tools and through the computer interface.

It is possible to argue that the traditional architectural drawing developed in an interchange between sketching and constructing. The sketch has an immediate physical relation, and thus a relation of scale. It is a gesture that emerges in physical coordination between visual and perceptual impressions, motor function, and drawing tool. The sketch is immediate; it can rapidly search and test various courses, relations, or exchanges. The constructed drawing formalises the potential of the sketch by means of drawing tools, and gradually submits it to a geometric construction. However, there is no unambiguous linear relation between the two drawing forms. The sketch is seldom formalised by the drawing of 'correct' geometricised lines through its implied form universe. The formalised drawing rather reconstructs the potentials of the sketch in a new independent statement. This statement is opened up again by new sketches which subvert and reconfigure the construction of the formalised drawing in a constant interchange between that which builds and that which opens up.

The computer interface changes relations between body and drawing. There is a scale-based relation between drawing and building, but also a physical relation between the designer and the actual physical drawing. It is not unimportant whether the drawing is small or big. It influences what can be drawn and how it is perceived. The digital drawing changes this relation. The size of the drawing is fixed to the limits of the computer screen but the contents can be readily scaled and re-scaled within this boundary. The changed physical relationship is also connected to the execution of the drawing. The relation of the drawing between body, pencil and line is complicated by the computer interface in which the drawing is created in interchanges from hand to mouse to screen to printer.

Metaphorical ambiguity

This dissociated physical relation is at the crux of the challenges to digital drawing. It causes a displacement from the gesture of the sketch to the construction of the geometricised drawing. In the computer drawing, the unambiguous and the geometric have a tendency to become dominant with the risk of resulting in rigid incompleteness rather than constructive imperfection. The challenge to the digital medium may consist in overcoming the lack of ambiguity and rethinking the dynamic metamorphosis of the conventional drawing between that which is searching and opening, and that which is formalising and clarifying.

In *Words and Buildings*, Adrian Forty addresses the relation between language and drawing in the architecture of Modernism. He describes the overwhelming importance that modern architects have placed on the drawing – often at the cost of language. Forty calls attention to the language of architecture:

> *'Where drawings pretend to project a reality, language is about keeping reality at bay. Language permits signification, it encourages one thing to be "seen" as another, it stimulates the sense of potential ambiguity that lies at the basis of meaning, in a way that drawings can only do prosaically* [...] *There is only one kind of drawing that displays some of language's qualities of indistinctness and ambiguity – the sketch; and we might perhaps see in the greater value attached to the architectural sketch in the course of the twentieth century an attempt to render drawings more language-like.'*[4]

The Hydra drawings are not sketches, but they try to establish a similar ambiguity. They seek to develop a parallel to the speed and lightness of the sketch in the ability of the computer to absorb and manipulate different types of information. In the computer, all information is levelled into binary chains of numbers that can be processed

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mathematically. This levelling of information causes a particular flatness. However, this flatness can be seen as a potential rather than a problem. The computer makes it possible to remain on the surface. It makes it possible to copy, move and manipulate the different elements and information of the drawing with a certain superficiality and speed. It blends information, formalises it, and makes it mutually interchangeable. In this rapid, fluid exchange of information – and through the reproducibility and manipulability of the digital statement (in which the ability to remove information by means of the delete function may be the most significant of all) – the Hydra drawings seek to develop a new approach to digital drawing material. It is a productive approach in which the opening indefiniteness of the sketch is replaced by morphologically varied configurations. It offers an indefiniteness which continuously assimilates and segregates differing information, shifting between the contextualised and the autonomous. In this way, it may be possible to create an architectural drawing in which the physical measuring of the conventional architectural drawing is replaced by a consciously casual approach to the forced precision of the computer.

Notes

1. Alberto Perez Gomez, 'Questions of Representation: The Poetic Origin of Architecture', *Architectural Research Quarterly*, 9 (2005), 217–225.
2. Robin Evans, *The Projective Cast. Architecture and Its Three Geometries*, (Cambridge, Massachusetts: The MIT Press, 1995).
3. Stan Allen, 'The Digital Complex', *Log*, 5 (Spring/Summer 2005), 93–99.
4. Adrian Forty, *Words and Buildings. A Vocabulary of Modern Architecture* (New York: Thames & Hudson, 2000), p. 38.

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arq gratefully acknowledges
Tove Rosén, 25–30
Emelie Saltas, 1–6
Guro Sollid, 15–24
Flemming Rafn Thomsen, 7–14

Biography

Claus Peder Pedersen is Associate Professor at the Aarhus School of Architecture. He was educated at the School of Architecture at the Royal Academy of Fine Arts in Copenhagen. He is partner in the multidisciplinary office Blankspace.

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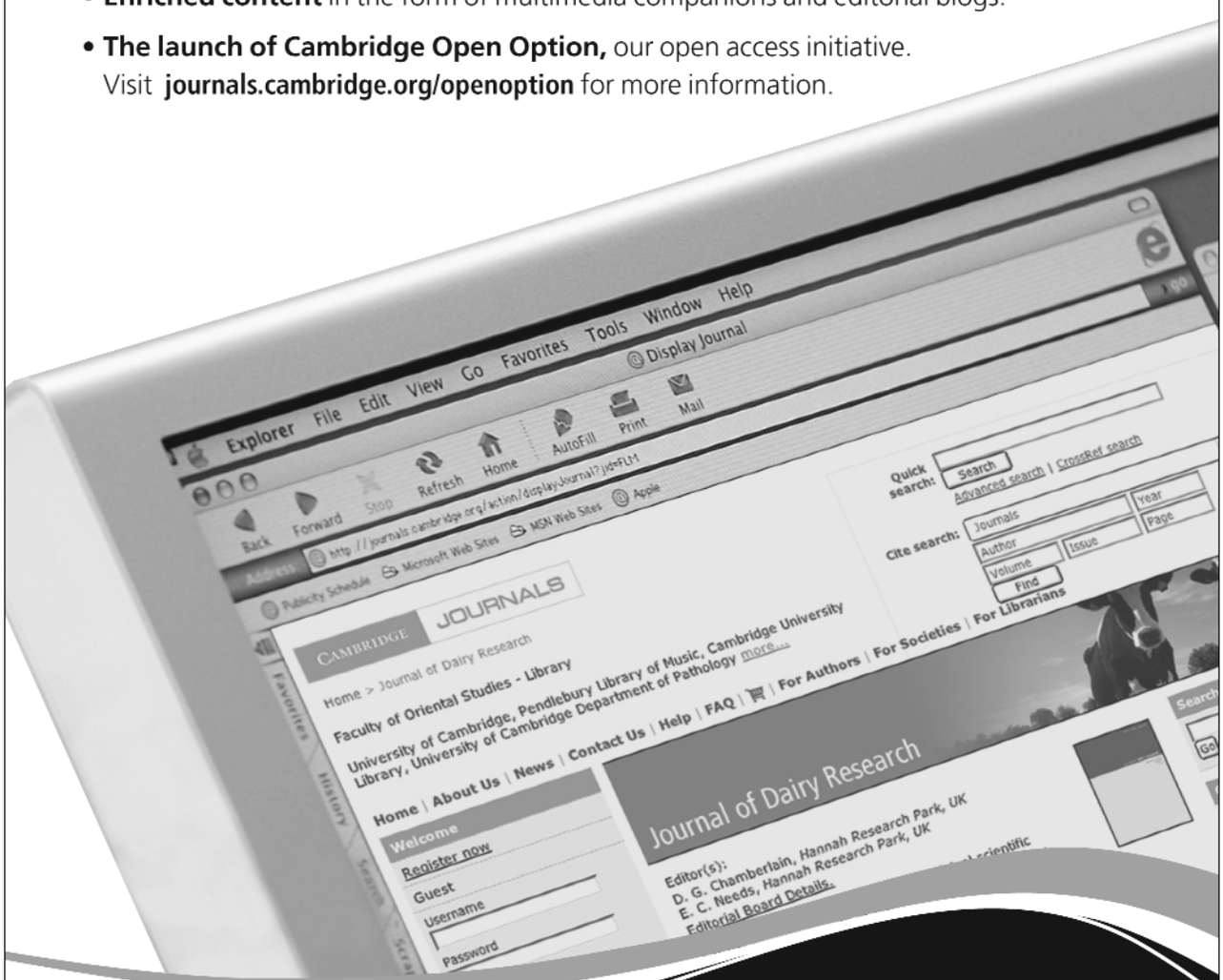
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